MINERALS YEARBOOK

1962

Volume II of Three Volumes

FUELS

U. S. DEPARTMENT OF THE INTERIOR
March 3, 1849

Prepared by the staff of the
BUREAU OF MINES
DIVISION OF PETROLEUM
DIVISION OF BITUMINOUS COAL
DIVISION OF ANTHRACITE

U. S. DEPOSITORY COPY
DO NOT DISCARD

639

Serials

UNITED STATES DEPARTMENT OF THE INTERIOR • Stewart L. Udall, Secretary

BUREAU OF MINES • Marling J. Ankeny, Director

Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1963

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price $2.50

Engineering
ML
.7U N3
MI
1962
2

1379474

FOREWORD

MINERALS YEARBOOK, 1962, published in three volumes, provides a record of performance of the Nation's mineral industries during the year, with enough background information to interpret the year's developments.

The three-volume issues of the Yearbook follow this pattern:

Volume I includes chapters on metal and nonmetal mineral commodities except mineral fuels. In addition, it contains a chapter reviewing these mineral industries, a statistical summary, and chapters on mining and metallurgical technology, employment and injuries, and technologic trends. The former "Minor Metals" and "Minor Nonmetals" chapters have been combined in one chapter on "Minor Metals and Minerals."

Volume II includes chapters on each mineral fuel, and helium, an employment and injuries presentation, and a mineral-fuels review chapter that summarizes development in the fuel industries.

Volume III contains chapters covering each of the 50 States, plus chapters on island possessions in the Pacific Ocean and the Commonwealth of Puerto Rico and island possessions in the Caribbean Sea, including the Canal Zone. Volume III also has a statistical summary chapter, identical with that in Volume I, and a chapter on employment and injuries.

Figures in the Minerals Yearbook are based largely upon information supplied by mineral producers, processors, and users, and acknowledgment is made of this indispensable cooperation given by industry. Information obtained from individuals through confidential surveys has been grouped to provide statistical aggregates. Data on individual producers are presented only if available from published or other nonconfidential sources, or when permission of the individuals concerned has been granted.

MARLING J. ANKENY, *Director*

ACKNOWLEDGMENTS

The chapters in this volume of the MINERALS YEARBOOK were prepared by the staffs of several divisions in the Bureau. Those on bituminous coal and its products were prepared under the general supervision of T. Reed Scollon, Chief, Division of Bituminous Coal, and T. W. Hunter, Chief, Branch of Bituminous-Coal Economics and Statistics; the chapters on petroleum and related commodities were prepared under the general supervision of C. C. Anderson, Chief, Division of Petroleum, and D. S. Colby, Chief, Branch of Petroleum Economics; the anthracite chapter was prepared under the general direction of Joseph A. Corgan, Chief, Division of Anthracite; the helium chapter was prepared under the direction of Henry P. Wheeler, Jr., Assistant Director—Helium. Preparation of this volume was coordinated by William C. Elliott, Jr., Executive Assistant to the Chief, Division of Petroleum, and Thelma K. Stewart, analytical statistician.

Because of the many sources of data presented, the Bureau cannot credit each individually, but acknowledgment is made of the splendid cooperation of producers and users of fuels who supplied information, trade associations, scientific journals, international organizations, and State and Federal agencies. The Bureau of the Census, U.S. Department of Commerce, furnished data on foreign trade from which the import and export tables in these chapters were compiled by the Bureau of Mines under the direction of M. B. Price, assisted by E. D. Page. World production tables were compiled under the direction of Berenice B. Mitchell from many sources including data from the U.S. Foreign Service, Department of State.

The mining and geology and related departments of the respective States have been most cooperative and have made available supplementary and verifying information regarding production and plant operations. For their assistance the Bureau is deeply grateful, and acknowledgment is made to the following State organizations that assisted with the canvasses of bituminous coal and lignite:

Alabama: Division of Safety and Inspection, Birmingham.
Alaska: Department of Natural Resources, Division of Mines and Minerals, Juneau.
Arizona: State mine inspector, Phoenix.
Arkansas: State mine inspector, Fort Smith.
Colorado: Colorado Coal Mine Inspection Department, Denver.
Georgia: Department of Mines, Mining, and Geology, State Division of Conservation, Atlanta.
Illinois: State Department of Mines and Minerals, Springfield.
Indiana: Bureau of Mines, Terre Haute.
Iowa: State mine inspectors, Des Moines.
Kansas: State Mine Inspection Division, Pittsburgh.
Kentucky: Kentucky Department of Mines and Minerals, Lexington.
Maryland: Maryland Bureau of Mines, Westernport.

Missouri: Division of Mine Inspection, Jefferson City.
New Mexico: State inspector of mines, Albuquerque.
North Dakota: State coal-mine inspector, Bismarck.
Ohio: Division of Mines and Mining, Ohio Department of Industrial Relations, Columbus.
Oklahoma: Chief mine inspector, Oklahoma City.
Pennsylvania: Pennsylvania Department of Mines and Mineral Industries, Harrisburg.
Tennessee: Tennessee Division of Mines, Knoxville.
Utah: Safety Division, Industrial Commission of Utah, Salt Lake City.
Virginia: Division of Mines, Virginia Department of Labor and Industry, Big Stone Gap.
Washington: Chief coal-mine inspector, Department of Labor and Industries, Seattle.
West Virginia: West Virginia Department of Mines, Charleston.
Wyoming: State coal-mine inspector, Rock Springs.

Appreciation is also expressed to the Commonwealth of Pennsylvania Department of Mines and Mineral Industries, Harrisburg, and the Commonwealth of Massachusetts, Division on Necessaries of Life, Boston, for assistance in acquiring data on anthracite and to the following for their assistance with the peat canvass:

Michigan: Department of Conservation, Lansing.
New Jersey: Department of Conservation and Economic Development, Bureau of Geology and Topography, Trenton.
Washington: Department of Conservation and Development, Olympia.

Credit is also due the following State organizations that assisted with the petroleum and natural gas canvasses:

Arkansas: Arkansas Oil and Gas Commission, El Dorado; Department of Revenue, Little Rock.
California: California Department of Natural Resources, San Francisco; Public Utilities Commission, State of California, San Francisco.
Illinois: Oil and Gas Division and State Geological Survey Division, Urbana.
Kansas: Conservation Division, State Corporation Commission, Wichita; State Geological Survey, University of Kansas, Lawrence.
Louisiana: Louisiana Department of Conservation, Baton Rouge.
Maryland: Department of Geology, Mines, and Water Resources, Baltimore.
Michigan: Geological Survey Division, Department of Conservation, Lansing.
Mississippi: Mississippi State Oil and Gas Board, Jackson; Oil and Gas Severance Tax Division, Mississippi State Tax Commission, Jackson.
Missouri: Division of Geological Survey and Water Resources, Department of Business and Administration, Rolla; Geological Survey and Water Resources, Rolla.
New York: New York State Science Service, Albany.
North Dakota: North Dakota Geological Survey, Grand Forks.
Ohio: Oil and Gas Section, Department of Natural Resources, Columbus.
Oklahoma: Oklahoma Corporation Commission, Oklahoma City; Gross Production Division, Oklahoma Tax Commission, Oklahoma City.
Tennessee: Department of Conservation and Commerce, Nashville.
Texas: Oil and Gas Division, Railroad Commission of Texas, Austin; Oil and Gas Division, State Comptroller of Public Accounts, Austin.
Virginia: Geological Survey Division, Department of Conservation and Development, Charlottesville.
West Virginia: Geological and Economic Survey, Morgantown.

Grateful acknowledgment is made to the American Iron and Steel Institute, New York, N.Y.; the Anthracite Institute, Wilkes-Barre, Pa.; the Association of American Railroads, Washington, D.C.; the Upper Lake Docks Coal Bureau, Inc., St. Paul, Minn.; the Ore and Coal Exchange, Cleveland, Ohio; the National Association of Packaged Fuel Manufacturers, Topeka, Kans.; and the many other trade and industry associations that have provided data.

CONTENTS

Page
Foreword, by Marling J. Ankeny III
Acknowledgments V
Review of the mineral-fuel industries in 1962, by Robert E. Johnson, Jr., and Edward E. Johnson 1
Employment and injuries in the fuel industries, by Forrest T. Moyer 41
Coal and related products:
  Coal—bituminous and lignite, by W. H. Young, R. L. Anderson, and R. J. Phillips 47
  Coal—Pennsylvania anthracite, by J. A. Vaughn and Marian I. Cooke 165
  Coke and coal chemicals, by J. A. DeCarlo, E. T. Sheridan, and Maxine M. Otero 211
  Fuel briquets and packaged fuel, by Eugene T. Sheridan and Maxine M. Otero 273
  Peat, by Eugene T. Sheridan and Maxine M. Otero 291
Petroleum and related products:
  Carbon black, by Ivan F. Avery and Lulie V. Harvey 309
  Natural gas, by Ivan F. Avery and Lulie V. Harvey 321
  Natural gas liquids, by I. F. Avery, W. G. Messner, B. D. Furgang, and E. R. Eliff 343
  Crude petroleum and petroleum products, by James G. Kirby, Walter G. Messner, and Betty M. Moore 373
Helium, by Harold W. Lipper 517
Appendix: Tables of measurement 525
Index 527

Review of the Mineral-Fuel Industries

By Robert E. Johnson, Jr.[1] and Edward E. Johnson[2]

Contents

	Page		Page
General summary	1	Prices and costs	22
Production	2	Income and investment	28
Consumption	8	Research and development	31
Stocks	14	Government activities	33
Transportation	15	World review	34
Labor and productivity	16		

GENERAL SUMMARY

1962 was the second year of recovery from the mild 1960–61 recession. The year-to-year gain in constant dollar gross national product, our most comprehensive measure of the country's economic performance, was 6.0 percent (from $447.7 billion in 1961 to $474.8 billion in 1962). The unemployment rate declined from 6.7 percent to 5.6 percent. Although it was a good year, there were still unused resources of labor and capital which implied that the economy was operating below its potential. The year-to-year change in the Federal Reserve Board (FRB) index of industrial production of 7.6 percent masked the fact that more than one-third of the growth took place within 1961. The monthly index rose only 4.8 percent during 1962, from 114.3 in January to 117.8 in September. The fact that the economy as shown by the industrial index, rose rapidly in the first half of the year only to remain on a plateau of 119–120 during the second half, led some people to fear an imminent downward turn. This did not occur.

Neither production nor consumption of mineral fuels advanced as fast as the total economy. But consumption showed more gain than production, 5 percent compared with somewhat less than 4 percent. Production of both crude oil and natural gas reached new highs while bituminous coal production was the highest in 5 years.

Although heating-cooking and railroads account for 75 percent of domestic consumption of distillate fuel oil, they show a lower growth rate than total consumption. The same story holds for consumption of natural gas. The industrial sector is the largest consumer but the heating-cooking sector is a faster growing sector. The opposite is true in coal consumption; electric utilities are the largest consumer class and accounted for about 85 percent of the growth in 1962. Half of the electricity sales in the country were concentrated in the industrial states of the northeast, midwest, and far west. There were no significant stock changes during the year. Modes of transportation of mineral fuels and freight rates also showed little year-to-year change.

---

[1] General economist.

[2] General economist.

With one minor exception all mineral fuel and related industries showed employment declines from a year earlier. The various measures of productivity showed increases. Hours and earnings showed little change. Fuel prices remained steady. This was highlighted by the well head price of gas which increased 2.6 percent compared with an 8-percent increase in 1961. Book value of investment by domestic companies in foreign petroleum continued to increase. Half of this investment is in three areas: Europe, Venezuela, and the Middle East. Foreign investment in the United States petroleum industry amounted to $1.3 billion in 1961. The Netherlands, Canada, and the United Kingdom accounted for 95 percent of this investment.

Two developments concerning taxes occurred during the year. The Treasury announced new flexible depreciation guidelines on July 11, and the Revenue Act of 1962 provided tax credits for investment in machinery and equipment used in the United States. The national Fuels and Energy Study Group submitted their final report, "Assessment of Available Information on Energy in the United States," to the Senate Committee on Interior and Insular Affairs. The oil import control regulations were revised. Mexican and Canadian crude is exempt from the quota, which is now based on domestic production rather than demand.

Both imports and exports increased, imports by 10 percent, exports by 5 percent. Coal showed the largest export increase of the mineral fuel commodities and products. Our principal markets for coal exports continue to be Europe, Canada, and Japan. Crude oil accounts for more than half of our fuel related imports, but the largest percentage increase during the year was in gas imports. Our crude oil imports originate in Venezuela, Canada, and the Middle East. Most of the imported gas comes from Canada. World fuel production showed increases. European electricity production although not as large as U.S. production, continues to grow at a faster rate. Most world fuel prices remained steady.

There are four new tables in the review chapter: table 10, electricity consumption by region and class of consumer; table 26, the cost of electricity by region and by class of consumer; and table 33, foreign direct investment in the United States; and table 40, regional distribution of imports and exports. The tables on fringe benefits to labor which appeared in the 1961 review chapter (tables 25 and 26) do not appear this year because the information was based on a one-time survey, and therefore no new data are available.

DOMESTIC PRODUCTION

Changes in the domestic production of fuels and energy may be measured in several ways. Table 1 summarizes the total energy production from mineral fuels and waterpower in the United States in terms of British thermal unit (Btu) content of the various sources (see also figures 1 and 2). The values of mineral-fuel production are summarized in table 2, and the actual physical volume of production, weighted by values, are listed in tables 4 and 5. Since these measures are directed to different aspects of the fuels industries, it is not surprising that these measures sometimes move disparately.

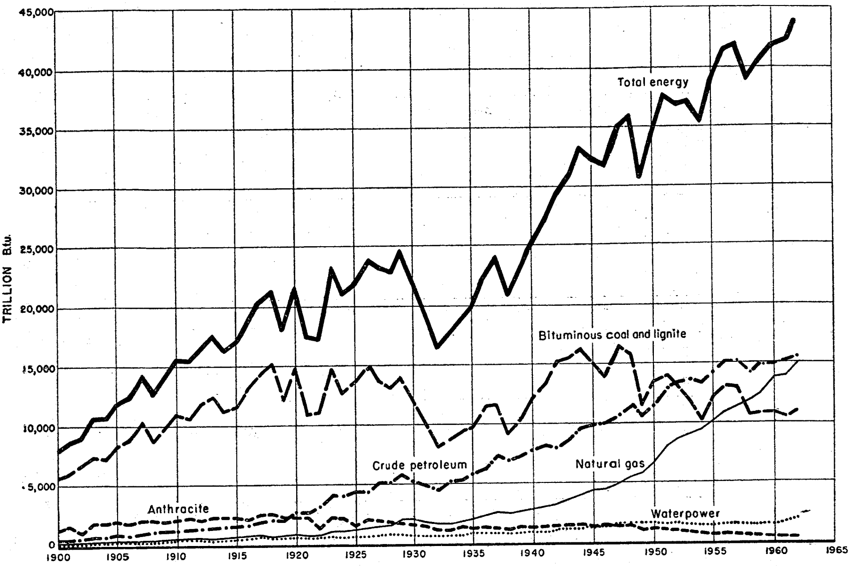


FIGURE 1.—Production of mineral-energy fuels and energy from waterpower in continental United States, 1900–62.

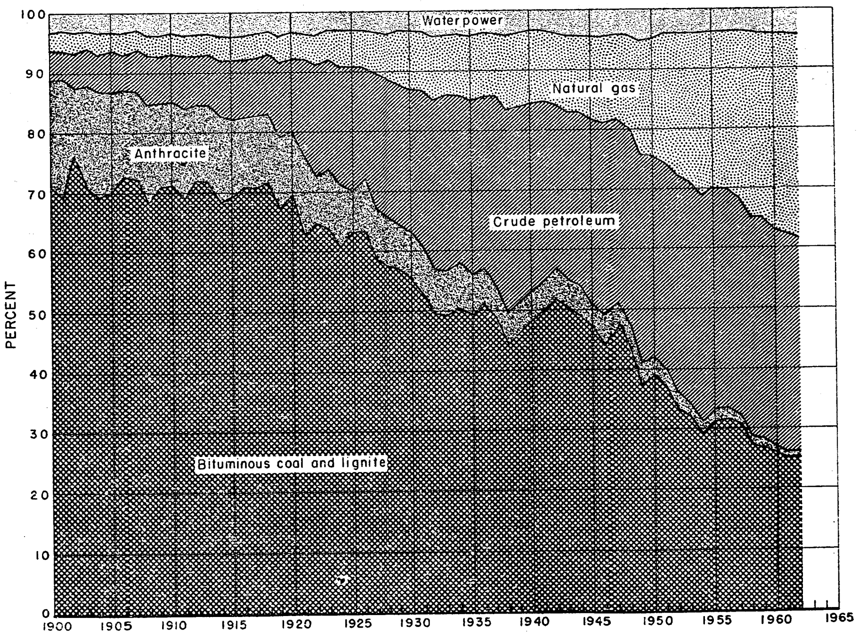


FIGURE 2.—Percentage of total production of British thermal units equivalent of mineral-energy fuels and energy from waterpower in continental United States, 1900–62.

TABLE 1.—Production of mineral energy fuels and energy from waterpower in trillion British thermal units and percentage contributed by each in the United States[1]

Year	Bituminous coal and lignite[2]	Anthracite	Crude petroleum	Natural gas, wet	Waterpower	Grand total	Percentage					
							Bituminous coal and lignite	Anthracite	Crude petroleum	Natural gas, wet	Waterpower	Total
1900	5, 563	1, 457	369	254	250	7, 893	70. 5	18. 4	4. 7	3. 2	3. 2	100. 0
1905	8, 255	1, 973	781	377	386	11, 772	70. 1	16. 8	6. 6	3. 2	3. 3	100. 0
1910	10, 928	2, 146	1, 215	547	539	15, 375	71. 1	14. 0	7. 9	3. 5	3. 5	100. 0
1915	11, 597	2, 260	1, 630	676	659	16, 822	69. 0	13. 4	9. 7	4. 0	3. 9	100. 0
1920	14, 899	2, 276	2, 569	883	738	21, 365	69. 7	10. 7	12. 0	4. 1	3. 5	100. 0
1921	10, 897	2, 298	2, 739	732	620	17, 286	63. 0	13. 3	15. 9	4. 2	3. 6	100. 0
1922	11, 063	1, 389	3, 234	843	643	17, 172	64. 5	8. 1	18. 8	4. 9	3. 7	100. 0
1923	14, 792	2, 371	4, 248	1, 113	685	23, 209	63. 7	10. 2	18. 3	4. 8	3. 0	100. 0
1924	12, 672	2, 233	4, 141	1, 263	648	20, 957	60. 5	10. 6	19. 8	6. 0	3. 1	100. 0
1925	13, 625	1, 570	4, 430	1, 314	668	21, 607	63. 1	7. 2	20. 5	6. 1	3. 1	100. 0
1926	15, 020	2, 145	4, 471	1, 452	728	23, 816	63. 1	9. 0	18. 8	6. 1	3. 0	100. 0
1927	13, 565	2, 034	5, 227	1, 598	776	23, 200	58. 5	8. 8	22. 5	6. 9	3. 3	100. 0
1928	13, 120	1, 914	5, 229	1, 734	854	22, 851	57. 4	8. 4	22. 9	7. 6	3. 7	100. 0
1929	14, 017	1, 875	5, 842	2, 118	816	24, 668	56. 8	7. 6	23. 7	8. 6	3. 3	100. 0
1930	12, 249	1, 762	5, 208	2, 148	752	22, 119	55. 4	8. 0	23. 5	9. 7	3. 4	100. 0
1931	10, 011	1, 515	4, 936	1, 869	668	18, 999	52. 7	8. 0	26. 0	9. 8	3. 5	100. 0
1932	8, 114	1, 266	4, 554	1, 729	713	16, 376	49. 5	7. 7	27. 8	10. 6	4. 4	100. 0
1933	8, 741	1, 258	5, 253	1, 733	711	17, 696	49. 4	7. 1	29. 7	9. 8	4. 0	100. 0
1934	9, 415	1, 452	5, 267	1, 970	698	18, 802	50. 1	7. 7	28. 0	10. 5	3. 7	100. 0
1935	9, 756	1, 325	5, 780	2, 136	806	19, 803	49. 2	6. 7	29. 2	10. 8	4. 1	100. 0
1936	11, 504	1, 386	6, 378	2, 411	812	22, 491	51. 2	6. 1	28. 4	10. 7	3. 6	100. 0
1937	11, 673	1, 317	7, 419	2, 684	871	23, 964	48. 7	5. 5	31. 0	11. 2	3. 6	100. 0
1938	9, 132	1, 171	7, 043	2, 565	866	20, 777	44. 0	5. 6	33. 9	12. 3	4. 2	100. 0
1939	10, 345	1, 308	7, 337	2, 763	838	22, 591	45. 8	5. 8	32. 5	12. 2	3. 7	100. 0
1940	12, 072	1, 308	7, 849	2, 979	880	25, 088	48. 1	5. 2	31. 3	11. 9	3. 5	100. 0
1941	13, 471	1, 432	8, 133	3, 162	934	27, 132	49. 6	5. 3	30. 0	11. 7	3. 4	100. 0
1942	15, 267	1, 532	8, 043	3, 436	1, 136	29, 414	51. 9	5. 2	27. 3	11. 7	3. 9	100. 0
1943	15, 463	1, 540	8, 733	3, 839	1, 304	30, 879	50. 1	5. 0	28. 3	12. 4	4. 2	100. 0
1944	16, 233	1, 618	9, 732	4, 176	1, 344	33, 103	49. 0	4. 9	29. 4	12. 6	4. 1	100. 0
1945	15, 134	1, 395	9, 939	4, 423	1, 442	32, 333	46. 8	4. 3	30. 7	13. 7	4. 5	100. 0
1946	13, 989	1, 537	10, 057	4, 550	1, 406	31, 539	44. 3	4. 9	31. 9	14. 4	4. 5	100. 0
1947	16, 522	1, 453	10, 771	5, 012	1, 426	35, 184	47. 0	4. 1	30. 6	14. 2	4. 1	100. 0
1948	15, 707	1, 451	11, 717	5, 615	1, 481	35, 971	43. 7	4. 0	32. 6	15. 6	4. 1	100. 0
1949	11, 472	1, 085	10, 683	5, 911	1, 539	30, 690	37. 4	3. 5	34. 8	19. 3	5. 0	100. 0

1950	13, 527	1, 120	11, 449	6, 841	1, 573	34, 510	39. 2	3. 2	33. 2	19. 8	4. 6	100. 0
1951	13, 982	1, 084	13, 037	8, 106	1, 559	37, 768	37. 0	2. 9	34. 5	21. 5	4. 1	100. 0
1952	12, 231	1, 031	13, 282	8, 705	1, 581	36, 830	33. 2	2. 8	36. 1	23. 6	4. 3	100. 0
1955	11, 981	786	13, 671	9, 116	1, 522	37, 076	32. 3	2. 1	36. 9	24. 6	4. 1	100. 0
1954	10, 262	739	13, 427	9, 488	1, 449	35, 365	29. 0	2. 1	38. 0	26. 8	4. 1	100. 0
1955	12, 174	665	14, 410	10, 204	1, 447	38, 900	31. 3	1. 7	37. 1	26. 2	3. 7	100. 0
1956	13, 123	734	15, 181	10, 930	1, 542	41, 510	31. 6	1. 8	36. 6	26. 3	3. 7	100. 0
1957	12, 909	644	15, 178	11, 571	1, 524	41, 826	30. 9	1. 5	36. 3	27. 7	3. 6	100. 0
1958	10, 754	538	14, 204	11, 943	1, 693	39, 132	27. 5	1. 4	36. 3	30. 5	4. 3	100. 0
1959	10, 795	524	14, 932	13, 036	1, 645	40, 932	26. 4	1. 3	36. 5	31. 8	4. 0	100. 0
1960	10, 886	478	14, 935	13, 822	1, 723	41, 844	26. 0	1. 2	35. 7	33. 0	4. 1	100. 0
1961	10, 558	443	15, 206	14, 336	1, 752	42, 295	25. 0	1. 1	35. 9	33. 9	4. 1	100. 0
1962	11, 034	429	[3] 15, 522	15, 004	1, 937	[3] 43, 926	25. 1	1. 0	35. 3	34. 2	4. 4	100. 0

---

[1] The unit heat values employed are: Anthracite, 12,700 B.t.u. per pound; bituminous coal and lignite, 13,100 B.t.u. per pound; petroleum, 5,800,000 B.t.u. per barrel; natural gas, total production × 1,075 B.t.u. minus repressuring vent and waste gas × 1,035. Waterpower includes installations owned by manufacturing plants and mines, as well as Government and privately owned public utilities. The fuel equivalent of waterpower is calculated from the kilowatt-hours of power produced wherever available, as it is true of all public, utility plants since 1919. Otherwise, the fuel equivalent is calculated from the reported horsepower of installed water wheels, assuming a capacity factor of 20 percent for factories and mines and 40 percent for public utilities.

[2] Alaska included for all years.

[3] Preliminary.

TABLE 2.—Value of mineral production in the United States by mineral group[1]

(Million dollars)

Mineral groups[2]	1953–57 (average)	1958	1959	1960	1961	1962[3]	Change in 1962 from 1961 (percent)
Metals and nonmetals except fuels:							
Nonmetals	2, 892	3, 346	3, 721	3, 732	3, 846	4, 073	+5. 9
Metals	1, 974	1, 594	1, 570	2, 022	1, 927	1, 931	+. 2
Total	4, 866	4, 940	4, 291	5, 754	5, 773	6, 004	+4. 0
Mineral fuels	11, 080	11, 589	11, 950	12, 142	12, 358	12, 724	+3. 0
Grand total	15, 946	16, 529	16, 241	17, 896	18, 131	18, 728	+3. 3

[1] Beginning with 1953 Alaska and Hawaii are included.
[2] For details see table 2 (Mineral production in the United States) in the Statistical Summary of Mineral production chapter.
[3] Preliminary figure.

TABLE 3.—Mineral fuels production in the United States

Mineral	1959		1960		1961		1962	
	Short tons (quantity)	Value (thousands)	Short tons (quantity)	Value (thousands)				
Asphalt and related bitumens (native):								
Bituminous limestone and sandstone	1, 518, 765	$3, 868	1, 242, 874	$3, 070	1, 558, 792	$12, 818	1, 647, 063	$14, 601
Gilsonite	379, 362	9, 385	383, 037	10, 020				
Carbon dioxide, natural (estimated) thousand cubic feet	485, 179	71	521, 169	99	545, 354	82	1, 144, 107	146
Coal:								
Bituminous and lignite[1] thousand short tons	412, 028	1, 965, 607	415, 512	1, 950, 425	402, 977	1, 844, 563	422, 149	1, 891, 553
Pennsylvania anthracite do	20, 649	172, 320	18, 817	147, 116	17, 446	140, 338	16, 894	134, 094
Helium thousand cubic feet	375, 408	6, 144	475, 179	7, 768	551, 785	10, 263	599, 519	20, 905
Natural gas million cubic feet	12, 046, 115	1, 556, 800	12, 771, 038	1, 789, 970	13, 254, 025	1, 996, 241	13, 876, 622	2, 145, 301
Natural gas liquids:								
Natural gasoline and cycle products thousand gallons	5, 597, 102	408, 694	5, 842, 507	416, 819	6, 105, 463	412, 019	6, 244, 522	444, 817
LP gases do	7, 874, 706	349, 802	8, 444, 074	391, 566	9, 085, 465	370, 186	9, 409, 083	353, 334
Peat	419, 460	4, 372	470. 889	5, 138	[2] 531, 067	[2] 5, 036	571, 873	5, 186
Petroleum (crude) thousand 42-gallon barrels	2, 574, 590	7, 473, 336	2, 574, 933	7, 420, 181	2, 621, 758	7, 565, 582	2, 676, 185	7, 768, 822
Total mineral fuels	----------	11, 950. 000	----------	12, 142, 000	----------	[2] 12, 357, 128	----------	12, 778, 759
Total all other minerals	----------	5, 291, 000	----------	5, 751, 000	----------	5, 620, 000	----------	----------
Grand total, mineral production	----------	17, 241, 000	----------	17, 893, 000	----------	[2] 18, 230, 231	----------	18, 833, 637

[1] Includes small quantity of anthracite mined in States other than Pennsylvania.
[2] Revised figure.

Total energy production measured in Btu's posted a year-to-year gain of 3.8 percent. All the fuel commodities except anthracite shared in this increase. The value of mineral-fuel production increased by $366 million, a 3-percent gain. The fuel component of both the Bureau of Mines index of physical volume and the Federal Reserve index of industrial production rose 2.9 percent.

Total Energy.—Production of mineral fuels and energy from waterpower increased by 1,621 trillion Btu to a total of 43,926 trillion Btu. Natural gas accounted for the largest physical increase, 658 trillion Btu, but both natural gas and bituminous coal recorded the same percentage increase, 4.5 percent. The largest percentage increase, 10.5 percent, was registered by waterpower, but this was not a significant part of the total increased energy production because only 4.5 percent of domestic energy production is waterpower.

Value of Production.—The increase of 3 percent in the value of production of mineral fuels reflects almost entirely an increase in physical quantity rather than price increases. This is demonstrated by the fact that the fuels segment of the index of physical volume showed almost exactly the same increase as the value measure.

Domestic Production.—All the commodities except anthracite increased in volume (table 3). The largest percentage increases were in the two nonfuel items, helium, an 8.7-percent increase, and peat, a 7.7-percent increase. Both natural gas and bituminous coal showed a 4.7-percent increase in volume, but while the value of bituminous coal increased only 2.5 percent, the value of natural gas increased 7.5 percent.

Indexes of Physical Production.—The Bureau of Mines index of the physical volume of mineral production in the United States is comprehensive and uses shifting weights to reflect the changing patterns of production and consumption as the economy grows and changes. The fuels component of the index reached a record 104 in 1962. The coal segment increased to 95, the highest in 5 years, and the oil and gas component attained a new high of 107.

The FRB Index of Industrial Production, like the Bureau of Mines index, has a mineral fuels segment composed of two parts, coal and crude oil-natural gas. The movements of the Bureau and the FRB indexes show similar characteristics. The crude oil-natural gas component includes oil and gas drilling as well as production. In order to eliminate the drilling, the details of the crude and gas production are shown separately. The FRB index is available monthly on a seasonally adjusted basis. The monthly record in table 5 shows that crude oil and natural gas production remained essentially stable throughout the year but that coal production displayed a downward drift from 100 in January to 96 in December.

TABLE 4.—Indexes of physical volume of mineral production in the United States, by groups and subgroups [1]

(1957–59=100)

Year	All minerals	Fuels			Metals	Nonmetals
		Total	Coal	Crude oil [2] and natural gas		
1952	92.1	93.8	112.3	88.0	115.8	73.0
1953	93.5	94.6	107.0	90.7	122.4	74.7
1954	89.6	90.5	92.4	89.8	100.3	80.9
1955	98.9	99.0	106.8	96.4	118.2	89.0
1956	104.5	104.8	115.4	101.5	120.4	95.4
1957	104.8	104.6	112.5	102.1	122.1	97.1
1958	95.9	95.9	93.7	96.5	93.3	97.4
1959	99.4	99.6	93.9	101.4	84.5	105.4
1960	102.1	100.3	94.0	102.3	107.5	108.0
1961	102.9	101.2	90.8	[3] 104.7	103.3	[3] 110.3
1962	106.2	104.1	94.9	107.0	106.1	116.1

[1] For description of index, see Minerals Yearbook 1956, v. 1, Review of the Mineral Industries, pp. 2-5. Indexes for components of the fuels index go back to 1880 (the initial year of the overall index) Review of the Mineral-Fuel Industries in Minerals Yearbook 1958, v. II, pp. 9-10.

[2] Does not cover isopentane, LP-gases and other natural-gas liquids.

[3] Revised figure.

TABLE 5.—Indexes of industrial production, mineral fuels, seasonally adjusted [1]

(1957–59=100)

Year and month	Total industrial production	Total mining	Coal, oil, and gas	Coal	Crude oil and natural gas		
					Total [2]	Crude oil	Gas and gas liquids
1958	93.7	95.6	95.6	93.4	96.0	96.0	97.6
1959	105.6	99.7	99.9	93.2	101.2	101.1	104.4
1960	108.7	101.6	99.7	93.7	101.0	100.9	113.2
1961	109.8	102.6	100.9	90.1	103.1	103.0	116.8
1962	118.3	105.0	103.8	95.3	105.5	105.1	120.4
January	114.6	103.8	102.9	100.3	103.5	102.1	119.8
February	116.3	104.2	102.7	97.4	103.8	103.2	117.4
March	117.3	104.8	103.0	96.8	104.2	102.4	120.4
April	117.8	105.4	103.4	94.7	105.2	104.1	118.5
May	118.3	105.1	102.7	93.0	104.6	104.1	120.1
June	118.4	105.2	103.2	92.8	105.4	105.6	119.5
July	119.4	106.5	104.9	92.8	107.4	107.7	121.6
August	119.4	105.4	104.2	93.8	106.3	106.7	119.2
September	119.8	105.7	105.2	94.2	107.5	107.8	121.3
October	119.2	105.2	105.1	94.3	107.3	107.2	121.2
November	119.5	105.7	105.5	96.6	107.4	107.5	123.7
December	119.1	103.2	102.8	95.6	104.2	103.8	121.9

[1] Index rebased with 1957–1959=100.

[2] Total also includes oil and gas drilling.

Source: Board of Governors of Federal Reserve System, Industrial Production 1957–59 base and Industrial Production Indexes for 1962.

CONSUMPTION

The first table in this section expresses consumption in British thermal units. In this way it is possible to analyze the energy economy as an entity. The other tables in the section express consumption in the usual physical units.

Calculated Energy Consumption—Total energy consumption in 1962, as measured in Btu, showed an increase of almost 5 percent over the 1961 figure. All components except anthracite showed increases. The largest absolute increase was made by gas and gas liquids, which accounted for 45 percent of the increased energy consumption during the year. The biggest percentage gains were made by petroleum imports and waterpower, 15 percent and 10 percent respectively. The changes in the percent of energy market supplied by the various fuels continued recent trends. That part of the market supplied by gas and gas liquids increased while the percentage of the market supplied by coal and petroleum declined slightly.

Consumption Patterns.—Apparent consumption patterns in 1962 did not deviate from the experience of recent years. Natural gas continues to show the largest percentage gains, while at the other end of the scale anthracite continues to decline. In between the extremes are bituminous coal and crude oil, both showing substantial gains. This contrasts with last year's pattern when crude showed a small increase and there was a modest decline in bituminous coal consumption. All significant classes of consumers of distillate registered increases during the year. The two largest categories of consumers, heating-cooking and railroads, accounted for 75 percent of total consumption, but while total consumption increased 5.5 percent these two dominant consumers showed only a 3.6-percent increase. Consumption of residual fuel oil showed only a nominal 1-percent gain. The industrial sector continues to be the largest consumer of natural gas, but the rate of growth in this sector is lower than the space heating-cooking sector. While the heating-cooking sector grew 8.3 percent during the year, the industrial sector grew at a rate of 5.5 percent. Domestic consumption of bituminous coal increased by more than 13 million tons. Eleven million tons was accounted for by electric utilities, but all classes except ships, registered increases. Electric utilities now account for 50 percent of domestic consumption, and the proportion continues to grow.

Electricity sales by region and by the important classes of consumers (table 10), appear in the review chapter for the first time. The regional classifications system is the one used by the Bureau of the Census. 1962 data are not yet available, so a time series with 1961 as the last year is shown. Total sales in 1961 were 5½ percent greater than 1960 sales. Half of the sales were concentrated in the industrial east (Middle Atlantic and East North Central) and the Pacific coast. The growth rate in the regions shows different tendencies. In the Pacific States the rate was 7.3 percent while in the Middle Atlantic it was close to the national average of slightly more than 5½ percent. The rate in the industrial midwest (East North Central), 3.4 percent, lagged behind the national average. It is also significant to note that industrial consumption nationally is twice as large as residential, consumption.

Projections.—Table 11, which appeared for the first time in the 1961 Yearbook, has been revised only slightly. None of the 1975 projections have been changed during the year but some of the 1960 actual data have been revised. As the projected growth rate is based on 1960 actual, some of the projected growth rates have been changed slightly. The actual rates of growth for the two year period 1960 to 1962 are shown. Because of the short time period involved, the significance of the comparison between actual and projected growth

TABLE 6.—Calculated consumption of energy fuels and energy from waterpower in trillion British thermal units and percentage contributed by each in the United States [1]

Year	Bituminous coal and lignite [2]	Anthracite	Crude oil	Petroleum products net: E, exported; I, imported	Natural gas, dry	Natural gas liquids	Waterpower	Grand total	Percentage							
									Bituminous coal and lignite	Anthracite	Crude	Petroleum products net: E, exported; I, imported	Natural gas, dry	Natural gas liquids	Waterpower	Grand total
1920	13,325	2,179	3,027	E 393	827	42	775	19,782	67.4	11.0	15.3	E 2.0	4.2	0.2	3.9	100.0
1921	10,266	2,082	3,016	E 342	682	50	656	16,410	62.6	12.7	18.4	E 2.1	4.1	.3	4.0	100.0
1922	11,185	1,443	3,390	E 319	785	56	675	17,215	65.0	8.4	19.7	E 1.9	4.6	.3	3.9	100.0
1923	13,598	2,208	4,419	E 389	1,032	90	727	21,685	62.7	10.2	20.4	E 1.8	4.8	.4	3.3	100.0
1924	12,681	2,050	4,228	E 464	1,170	103	685	20,453	62.0	10.0	20.7	E 2.3	5.7	.5	3.4	100.0
1925	13,079	1,627	4,641	E 485	1,212	124	701	20,899	62.6	7.8	22.2	E 2.3	5.8	.6	3.3	100.0
1926	13,954	1,961	4,876	E 545	1,335	149	765	22,495	62.0	8.7	21.7	E 2.4	5.9	.7	3.4	100.0
1927	13,095	1,897	5,027	E 650	1,465	179	815	21,828	60.0	8.7	23.0	E 3.0	6.7	.8	3.8	100.0
1928	13,069	1,871	5,474	E 711	1 588	200	890	22,381	58.4	8.4	24.4	E 3.2	7.1	.9	4.0	100.0
1929	13,612	1,815	5,894	E 600	1,942	246	847	23,756	57.3	7.6	24.8	E 2.5	8.2	1.0	3.6	100.0
1930	11,921	1,718	6,148	E 496	1,969	243	785	22,288	53.5	7.7	27.6	E 2.2	8.8	1.1	3.5	100.0
1931	9,743	1,484	5,304	E 339	1,715	200	692	18,799	51.8	7.9	28.2	E 1.8	9.1	1.1	3.7	100.0
1932	8,041	1,283	4,830	E 240	1,594	158	726	16,392	49.1	7.8	29.5	E 1.5	9.7	1.0	4.4	100.0
1933	8,323	1,260	5,143	E 299	1,600	144	729	16,900	49.2	7.5	30.4	E 1.8	9.5	.9	4.3	100.0
1934	9,008	1,410	5,136	E 318	1,819	161	721	17,937	50.2	7.9	28.6	E 1.8	10.2	.9	4.0	100.0
1935	9,336	1,298	5,799	E 300	1,974	169	831	19,107	48.9	6.8	30.4	E 1.6	10.3	.9	4.3	100.0
1936	10,697	1,351	6,426	E 302	2,221	184	841	21,418	49.9	6.3	30.0	E 1.4	10.4	.9	3.9	100.0
1937	11,286	1,280	7,004	E 400	2,468	208	905	22,751	49.6	5.6	30.8	E 1.7	10.8	.9	4.0	100.0
1938	8,811	1,148	6,921	E 456	2,348	209	899	19,880	44.3	5.8	34.8	E 2.3	11.8	1.1	4.5	100.0
1939	9,854	1,262	7,327	E 486	2,539	221	872	21,589	45.6	5.9	33.9	E 2.2	11.8	1.0	4.0	100.0
1940	11,290	1,245	7,662	E 175	2,726	243	917	23,908	47.2	5.2	32.1	E .7	11.4	1.0	3.8	100.0
1941	12,893	1,338	8,343	E 139	2,851	364	975	26,625	48.4	5.0	31.3	E .5	10.7	1.4	3.7	100.0
1942	14,149	1,435	7,987	E 320	3,102	367	1,177	27,897	50.7	5.2	28.6	E 1.1	11.1	1.3	4.2	100.0
1943	15,557	1,450	8,538	E 310	3,481	379	1,347	30,442	51.1	4.8	28.1	E 1.0	11.4	1.2	4.4	100.0
1944	15,447	1,509	9,923	E 662	3,775	442	1,387	31,821	48.5	4.7	31.2	E 2.1	11.9	1.4	4.4	100.0
1945	14,661	1,311	10,199	E 580	3,973	491	1,486	31,541	46.5	4.2	32.3	E 1.8	12.6	1.5	4.7	100.0
1946	13,110	1,369	10,270	E 283	4,089	493	1,446	30,494	43.0	4.5	33.7	E .9	13.4	1.6	4.7	100.0
1947	14,302	1,224	11,065	E 262	4,518	564	1,459	32,870	43.5	3.7	33.7	E .8	13.8	1.7	4.4	100.0
1948	13,622	1,275	12,085	E 147	5,033	619	1,507	33,994	40.1	3.8	35.5	E .4	14.8	1.8	4.4	100.0
1949	11,673	958	11,402	I 57	5,289	660	1,565	31,604	36.9	3.0	36.1	I .2	16.7	2.1	5.0	100.0

1950	11,900	1,013	12,304	I 402	6,150	783	1,601	34,153	34.8	3.0	36.0	I 1.2	18.0	2.3	4.7	100.0
1951	12.285	940	13,867	I 107	7,248	874	1,592	36,913	33.3	2.5	37.6	I .3	19.6	2.4	4.3	100.0
1952	10,971	897	14,248	I 132	7,760	954	1,614	36,576	30.0	2.4	39.0	I .4	21.2	2.6	4.4	100.0
1953	11,182	711	14,912	I 180	8,156	1,006	1,550	37,697	29.7	1.9	39.5	I .5	21.6	2.7	4.1	100.0
1954	9,512	683	14,830	I 260	8,554	1,042	1,479	36,360	26.2	1.9	40.8	I .7	23.5	2.8	4.1	100.0
1955	11,104	599	15,956	I 372	9,232	1,196	1,497	39,956	27.8	1.5	39.9	I .9	23.1	3.0	3.8	100.0
1956	11,338	610	16,994	I 424	9,834	1,209	1,598	42,007	27.0	1.4	40.5	I 1.0	23.4	2.9	3.8	100.0
1957	10,838	528	16,960	I 368	10,416	1,242	1,568	41,920	25.8	1.3	40.5	I .9	24.8	3.0	3.7	100.0
1958	9,607	483	16,308	I 1,120	10,995	1,240	1,740	41,493	23.1	1.2	39.3	I 2.7	26.5	3.0	4.2	100.0
1959	9,596	478	16,994	I 1,313	11,991	1,348	1,691	43,411	22.1	1.1	39.2	I 3.0	27.6	3.1	3.9	100.0
1960	9,967	447	17,172	I 1,436	12,736	1,427	1,775	44,960	22.2	1.0	38.2	I 3.2	28.3	3.2	3.9	100.0
1961	9,809	404	17,372	I 1,554	13,228	1,498	1,777	45,642	21.5	0.9	38.0	I 3.4	29.0	3.3	3.9	100.0
1962	10,160	381	17,853	I 1,797	14,125	1,605	1,965	47,882	21.2	.8	37.3	I 3.8	29.5	3.3	4.1	100.0

---

[1] The heat values employed are: Anthracite, 12,700 B.t.u. per pound; bituminous coal and lignite, 13,100 B.t.u. per pound; crude oil, 5,800,000 B.t.u. per barrel; weighted average British thermal units on petroleum products by using 5,248,000 gasoline, 5,670,000 kerosene, 5,825,000 distillate, 6,287,000 residual, 6,064,800 lubricants, 5,537,280 wax, 6,636,000 asphalt, and 5,796,000 miscellaneous; natural gas dry, 1,035 B.t.u. per cubic foot; natural gas liquids weighted average British thermal units based on production natural gasoline 110,000 B.t.u. per gallon, and LP-gas 95,500 B.t.u. per gallon. Waterpower converted to coal equivalent at the prevailing rate of pounds of coal per kilowatt-hour each year at central electric stations.

[2] Alaska included for all years.

rates is limited. It is planned to compute the actual growth rates annually and publish new projections as they are made by recognized authorities. As the number of years in the actual growth rate increases, the significance of the comparison between actual and projected growth rates increases. It is interesting to note that only two of the items, natural gas and coal, differ greatly in the 15-year projected growth rate and the 2-year actual data.

TABLE 7.—Apparent consumption of mineral fuels and related products

Commodity	1961	1962	Percent change from 1961
Fuels:			
Bituminous coal .... million net tons	374.4	387.8	+3.6
Crude petroleum, runs to stills .... millions of barrels	2,987.2	3,069.6	+2.8
Natural gas .... million cubic feet	13,081.7	13,890.1	+6.2
Anthracite .... million net tons	15.9	15.0	−5.7
Products:			
All oils, domestic demands .... million barrels	[1] 3,579.2	3,733.2	+4.3
Coke .... million net tons	[1] 52.1	51.8	−.6
Petroleum asphalt .... do	19.6	20.7	+5.6

[1] Revised figure.

TABLE 8.—Sales of fuel oil and natural gas in the United States, by major consumer groups

(Fuel oil—thousand barrels; natural gas—billion cubic feet)

Product and year	Railroads	Vessels	Gas and electric power plants	Smelters, mines, and manufactures	Space heating and cooking	Military	Oil company fuel	Miscellaneous	Total
Distillate fuel oil:									
1961	85,180	14,566	4,151	[1] 31,226	[1] 450,292	11,484	8,743	[1] 85,232	690,874
1962	86,803	15,836	4,100	34,951	466,830	13,041	9,055	98,479	729,095
Residual fuel oil:									
1961	5,347	87,308	87,881	153,766	121,097	36,762	44,399	6,426	542,986
1962	5,501	84,415	88,261	156,221	125,164	35,667	45,978	7,226	548,433
Natural gas:									
1961	--------	--------	[2] 1,825	5,725	[1] 4,325	--------	3,031	--------	[1] 13,082
1962	--------	--------	[2] 1,966	6,039	4,685	--------	3,166	--------	13,890

[1] Revised figure.
[2] Memorandum entry, not additive; includes gas other than natural. Natural gas component included under smelters, mines, and manufactures.

TABLE 9.—Consumption of bituminous coal and lignite in the United States, by major consumer groups

(Thousand net tons)

Year	Electric power utilities	Class I railroads	Coke plants	Steel and rolling mills	Cement mills	Other mining and manufacturing industries	Retail deliveries to other consumers	Bunker, foreign and lake vessel	Total
1959	165,788	2,600	79,181	6,674	8,510	73,396	29,138	969	366,256
1960	173,882	2,101	81,015	7,378	8,216	76,487	30,405	945	380,429
1961	179,629	(1)	73,881	7,495	7,615	77,280	27,735	770	374,405
1962	190,833	(1)	74,262	7,319	7,719	78,766	28,188	687	387,774

[1] Canvass discontinued.

Source: Data for electric power utilities is from Federal Power Commission; data for Class I railroads is from Association of American Railroads; and data for bunker, foreign and lake vessel is from Bureau of the Census.

TABLE 10.—Electrical energy sales to ultimate customers

(Million kilowatt-hours)

Region	1956			1957			1958		
	Total consumption	Residential [1]	Industrial and commercial	Total consumption	Residential [1]	Industrial and commercial	Total consumption	Residential [1]	Industrial and commercial
New England	21, 176	7, 180	13, 334	21, 982	7, 586	13, 677	22, 573	8, 149	13, 644
Middle Atlantic	85, 541	22, 193	57, 516	89, 342	23, 863	59, 480	89, 626	25, 466	57, 925
East North Central	120, 060	30, 017	85, 073	124, 872	32, 605	87, 173	125, 797	34, 548	85, 820
West North Central	31, 510	12, 843	17, 497	33, 508	13, 828	18, 504	34, 717	14, 673	18, 829
South Atlantic	60, 818	19, 566	39, 404	65, 609	21, 913	41, 646	69, 817	24, 446	43, 181
East South Central	75, 952	12, 007	63, 264	79, 126	13, 427	64, 986	78, 794	14, 943	63, 102
West South Central	40, 044	10, 898	27, 011	43, 588	12, 252	29, 095	46, 419	13, 729	30, 275
Mountain	21, 538	6, 264	14, 114	22, 748	6, 811	14, 780	23, 714	7, 288	15, 209
Pacific	72, 505	23, 981	46, 193	77, 054	26, 064	48, 535	77, 704	26, 889	48, 251
Total United States	529, 144	144, 949	363, 406	557, 829	158, 349	377, 876	569, 161	170, 131	376, 236
	1959			1960			1961 [2]		
New England	24, 790	8, 701	15, 237	26, 570	9, 213	16, 434	28, 652	10, 140	17, 432
Middle Atlantic	98, 021	27, 301	63, 706	106, 013	28, 594	69, 534	112, 080	30, 785	73, 095
East North Central	139, 596	37, 393	96, 380	147, 088	39, 541	102, 033	151, 885	41, 748	104, 358
West North Central	38, 157	16, 106	20, 780	44, 176	17, 368	25, 419	46, 415	18, 402	26, 260
South Atlantic	77, 763	26, 648	48, 676	86, 388	29, 368	54, 334	93, 274	32, 129	57, 601
East South Central	84, 015	16, 437	66, 781	87, 543	18, 504	68, 049	88, 821	19, 075	68, 736
West South Central	51, 612	15, 220	33, 766	57, 363	17, 290	37, 013	60, 399	17, 331	39, 831
Mountain	26, 010	8, 105	16, 541	29, 611	8, 947	19, 353	33, 514	8, 538	23, 430
Pacific	86, 779	30, 390	53, 617	96, 456	33, 067	59, 988	103, 491	30, 052	70, 223
Total United States [3]	626, 743	186, 401	415, 484	683, 199	202, 709	453, 298	720, 728	209, 021	482, 291

[1] Includes rural.
[2] Rural included in all three classes.
[3] Includes Alaska and Hawaii in 1960 and 1961.

Source: Edison Electric Institute, Statistical Yearbook of the Electric Utility Industry, 1956 to 1961.

TABLE 11.—Projections: Mineral fuels and economic trends

	1960 actual	1962 actual	Growthrate 1960–62	1975 projection	Projected growth rate (percent per year)
Population thousands	180,676	186,591	1.9	[1] 235,275	1.8
Labor force thousands	[2] 73,126	74,681	1.1	[3] 93,031	1.7
Gross national product billions of 1954 dollars	[2] 441	475	3.8	[4] 728	3.4
Index of industrial production (1957–59=100)	[2] 109	118.2	4.0	[4] 180	3.4
Energy consumption-U.S. trillion B.t.u.	44,960	47,882	3.2	[5] 70,404	3.0
Petroleum consumption (inc. natural gas liquids) million barrels	[2] 3,567	3,733	2.3	[5] 4,896	2.1
Natural gas consumption billion cubic feet	12,509	13,890	5.4	[5] 19,985	3.2
Coal consumption million tons	398	403	.6	725	4.1
Electrical energy consumption million kilowatt hours	849,006	943,586	5.4	[6] 2,256,000	6.8

[1] Bureau of the Census. Current Population Reports, p. 25, no. 215.
[2] Revised figure.
[3] Bureau of Labor Statistics.
[4] Bureau of Mines Staff, Mineral Facts and Problems. Bull. 585, 1960, 1,016 pp.
[5] T. Reed Scollon. Trends in Utilization of Energy Resources in the United States. Presented at World Power Conference, Melbourne, Australia, October 1962, 25 pages.
[6] Federal Power Commission Forecast, Jan. 30, 1962.

STOCKS

Physical Stocks.—The stocks of bituminous coal continued a downward trend begun in 1958. At the same time that stocks are decreasing, production is increasing and thus the stock-production ratio decreases. This is a favorable trend. The changes in stock levels of crude petroleum and products shows a mixed picture. While distillate and natural gas liquids stocks fell, stocks of crude petroleum, gasoline, and residual fuel oil increased. Although stock increases may be an unfavorable sign in petroleum and coal, they are the opposite in natural gas. The peak demand for gas is during the winter heating season. As storage facilities become available near consuming areas, stocks increase and the seasonal load differential on the pipelines decreases, because some of the gas for the seasonal peak is moved through the lines during the slack summer season.

TABLE 12.—Physical stocks of crude mineral fuels at yearend

(Producers' stocks, unless otherwise indicated)

Fuel	1958	1959	1960	1961	1962
Coal and related products: [1]					
Bituminous and lignite [2] net tons	80,263,680	79,654,678	76,898,317	74,449,230	72,577,910
Coke net tons	3,823,364	4,682,436	4,738,088	[3] 4,041,873	3,906,811
Petroleum and related products:					
Carbon black thousand pounds	300,923	218,893	292,982	287,899	261,659
Crude petroleum and petroleum products thousand barrels	789,538	808,970	784,558	825,074	836,869
Crude petroleum do	262,742	257,129	239,800	244,664	252,011
Natural gas liquids do	22,752	24,887	28,931	37,067	31,385
Gasoline do	187,004	187,613	194,774	[4] 184,167	190,138
Distillate fuel oil do	125,508	151,164	138,455	152,018	144,505
Residual fuel oil do	59,560	53,501	44,870	44,869	49,996
Petroleum asphalt do	9,757	10,948	12,991	12,999	14,252
Other refined products do	122,215	123,737	124,737	[4] 149,290	154,582
Natural gas [3] billion cubic feet	1,764	1,901	2,184	2,344	2,504

[1] Series on anthracite stocks in ground storage has been discontinued.
[2] Stocks at industrial, consumer, and retail yards and on upper Lake docks.
[3] American Gas Association.
[4] Revised figure.

TRANSPORTATION

Tables 13–16 in this section provide the essential information on methods and costs of mineral fuels transportation. The bulk of bituminous coal is shipped to market by rail, although there has been a trend to truck and water transportation. This has been the story in the recent past and was true again in 1962. Almost 75 percent of the coal produced moved to market by rail, although the percentage was slightly less than it was in 1961.

Over 90 percent of the mineral fuels moving by rail are coal and coke. Crude petroleum and products make up the remainder. Because data for the whole year 1962 are not available, the first half of 1961 and the first half of 1962 are compared. This limited information indicates a rise of more than 10 percent in the total and in coal. It appears that this is distorted because the first half of 1961 was depressed. Adjusting for this the probable change from 1961 to 1962 was around 5 percent rather than 10 percent. This 5 percent-increase would be in line with the 5 percent production increase in bituminous coal. About 95 percent of the mineral fuels moving by water in the United States are coal, crude petroleum, and a few petroleum products. Coal accounted for 30 percent of the total in 1962, whereas crude petroleum, gasoline and distillate and residual fuel oil accounted for just under two-thirds of the total. The increases in amounts shipped by water are about in line with increases in amounts produced, indicating no drastic change in the mode of transportation from producer to market. Freight rates showed essentially no change from 1961. Downward pressure on rates, both domestic and rail, has been evident for several years. Ocean freight rates continue to fluctuate around the pre-Suez rates, with the rates for coal (dry cargo) showing a more drastic reduction from 1956–57 high than the tanker rates.

TABLE 13.—Methods of shipment of bituminous coal and lignite from mines and used at mines in the United States.

Year	Method of shipment from mines: Shipped by rail and trucked to rail	Method of shipment from mines: Shipped by water and trucked to water	Method of shipment from mines: Trucked to final destination	Used at mines [1]	Total production
			THOUSAND NET TONS		
1958	305,642	43,899	50,605	10,300	410,446
1959	300,763	45,954	52,564	12,747	412,028
1960	303,865	46,784	52,699	12,164	415,512
1961	294,494	45,400	51,044	12,039	402,977
1962	307,327	48,107	54,853	11,862	422,149
			PERCENTAGE OF TOTAL		
1958	74.5	10.7	12.3	2.5	100.0
1959	73.0	11.1	12.8	3.1	100.0
1960	73.1	11.3	12.7	2.9	100.0
1961	73.1	11.3	12.6	3.0	100.0
1962	72.8	11.4	13.0	2.8	100.0

[1] Includes coal used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, transported from mines to point of use by conveyors or trams, made into beehive coke at mines, and all other uses at mines.

TABLE 14.—Rail transportation of mineral fuels and related products in the United States, by products [1]

(Thousand short tons)

Product	1960	1961	First half 1961	First half 1962 [2]	Change first half 1962 from first half 1961 (percent)
Coal:					
Anthracite [3]	16,840	14,963	7,065	7,020	−1
Bituminous	304,500	296,884	138,337	154,708	+12
Coke	16,453	14,328	6,254	8,563	+37
Crude petroleum	1,888	2,067	1,028	1,006	−2
Gasoline	7,531	6,861	3,440	3,116	−10
Distillate and residual fuel oil	7,279	6,369	3,304	3,229	−2
Asphalt	2,734	2,810	1,022	1,057	+3
Other [4]	16,013	15,482	7,938	8,220	+4
Total	373,238	359,724	168,388	186,919	+11

[1] Revenue freight originated, excluding forwarder and less than carload shipments, for which categories commodity detail is not available.
[2] Second half 1962 not available.
[3] Includes shipments to washeries and breakers.
[4] Lubricants, petroleum products, and gases.

Source: Interstate Commerce Commission, Freight commodity Statistics, Class I Steam Railways in United States, for years ended Dec. 31, 1960 and 1961; and quarterly reports, 1961 and 1962.

TABLE 15.—Water transportation of mineral fuels and related products in the United States, by products [1]

(Thousand short tons)

Product	1960	1961	1962 [2]	Change from 1961 (percent)
Coal:				
Anthracite	633	320	327	+2
Bituminous	132,230	[3] 127,181	136,010	+7
Coke	448	331	686	+107
Crude petroleum	74,138	[3] 78,297	80,970	+3
Gasoline	92,618	[3] 91,971	92,901	+1
Distillate fuel oil	74,004	[3] 77,988	79,560	+2
Residual fuel oil	49,665	[3] 44,986	45,215	+1
Asphalt	3,801	4,042	4,760	+18
Kerosine	9,255	[3] 9,146	9,314	+2
Other [4]	14,830	[3] 13,846	15,263	+10
Total	451,622	[3] 448,108	465,006	+4

[1] Domestic traffic, that is, traffic with Canal Zone, the Virgin Islands, and military cargoes carried in Defense Department vehicles are excluded.
[2] Preliminary figure.
[3] Revised figure.
[4] Includes lubricants, jet fuel, naphthene, and briquets.

Source: Department of the Army, Waterborne Commerce of the United States, Calendar year 1961 pt. 5, National Summaries, 1961 data are preliminary.

LABOR AND PRODUCTIVITY

Employment.—The Bureau of Mines publishes two sets of employment figures for bituminous coal mines. One set (presented in the next chapter of this volume) is unadjusted for lack of coverage, but it is directly comparable to the reported injuries and is used for calculating injury rates. These data are adjusted for coverage, and the resulting adjusted figures are published in the chapter on bituminous coal and used for the productivity analyses. Employment figures for the anthracite industry represent full coverage for both

TABLE 16.—Freight costs in domestic and international trade

Year	Domestic average revenue per ton (dollars)		Foreign (1953=100)	
	Anthracite (n.o.s.)	Bituminous cost	Dry cargo time charter	Tanker
1954	3.31	3.23	118	80
1955	3.33	3.24	214	83
1956	3.39	3.45	285	103
1957	3.52	3.57	198	109
1958	3.68	3.58	92	92
1959	3.65	3.45	92	82
1960	3.70	3.40	108	74
1961	3.65	3.40	120	70
1962	[1] 3.67	[1] 3.37	105	74

[1] 6 months' average. 1st- and 2nd-quarter reports 1962. Yearend report not available.

Source: Domestic data are from Interstate Commerce Commission, Bureau of Transport Economics and Statistics. Freight Commodity Statistics, June 1955–June 1962; foreign data is from United Nations Monthly Bulletin of Statistics, June 1962.

productivity and injury analyses and are virtually identical. The Bureau of Labor Statistics, U.S. Department of Labor, publishes a third set of employment data, based upon payroll information. The Bureau of Employment Security (BES), U.S. Department of Labor, publishes still another series based on reports to state agencies under unemployment security laws. Table 17 indicates the order of difference between the BLS information on total employment, the Bureau of Mines fully adjusted data, and the BES figures. Generally the series move in the same direction, but they have differed markedly on several occasions.

Productivity.—The productivity of labor continued to increase in bituminous coal mining and also rose in anthracite mining. The net tons per man per day reached 14.72 in bituminous coal mining (an alltime record), and was 5.92 in anthracite mining (also an alltime high) compared with 12.83 and 5.60, respectively, in 1960 and 6.77 and 2.83, respectively, in 1950.

The BLS calculates labor productivity for several manufacturing and mining industries. The data of interest to the fuel industry are presented in table 19. The productivity is expressed in three ways: production per employee, per production worker, and per production worker man-hour. All are expressed in terms of indexes. The common experience in the two industries shown is for the ratio of production workers to total employees to drop and hours worked per man to decrease. This means that the index per production-worker man-hour increases the fastest, and productivity per employee rises the slowest. The BLS does not publish a productivity series on the crude oil and natural gas industry because they have been unable to define accurately the labor force involved in crude oil and natural gas production.

The BLS employment data tell the same story this year that they have told for several years, decreases in nearly all segments of the mineral-fuel mining and related manufacturing industries. The one exception this year, as in the recent past, is "Other petroleum and coal products," and this industry is only 4.5 percent of the total employment in the mineral-fuel mining and related manufacturing industries. Although bituminous coal production posted a 4.5 percent year-to-year production increase, average employment was 6.5 percent less in 1962 than it had been in 1961. The crude oil and natural gas industry showed the same picture, declining employment in the face of increasing production. Production was up 3.3 percent while employment declined 1.5 percent. The month-to-month movement in bituminous coal was one of decline from the January high to a July low, a partial recovery in late summer and fall, and then another decline in the last two months of the year. December employment was 9 percent lower than the January high. The situation in crude oil and gas differed. The end of the year figure was lower than the January employment, but the high point was the summer. The picture in bituminous coal is saucer-shaped (summer low), while in crude oil and natural gas it is mound-shaped (summer high).

Hours and Earnings.—There was little year-to-year change in either average hours worked or average hourly earnings in the mineral-fuel mining and related manufacuring industries. Hours showed a slight upward tendency in all industries. With the exception of "Other petroleum and coal products" there was little change in hourly earnings. As a result of slightly higher hours and wage rates, weekly earnings were up marginally. The exception to this picture was the "Petroleum and other products industry." Here weekly earnings increased by 5.8 percent, a result of a 5 percent wage rate increase and a .8 percent increase in hours worked. But this industry still has the lowest weekly earnings rate of the industries covered in table 20, although it is only 1 percent less than the weekly earnings in crude oil and natural gas production. The highest weekly wages are paid in petroleum refining. This wage is 8.5 percent higher than that in the next highest paid industry, bituminous coal, and more than 20 percent higher than the lowest paid "Other petroleum and coal products."

Labor-Turnover Rates.—The accession rate in 1962 for both coal mining and petroleum refining was up. This is what would be expected in a year of growth. But the separation rate in both industries was also up from 1961, a result not to be expected in a growth year.

TABLE 17.—Comparison of data on total employment in the mineral-fuel industries

(Thousands)

Year	Petroleum		Bituminous coal			Anthracite		
	BLS data [1]	BES data [2]	BLS data [1]	BES data [2]	Bureau of Mines data [3]	BLS data [1]	BES data [2]	Bureau of Mines data [3]
1957	344.0	315.7	229.8	227.2	228.6	(4)	28.9	30.8
1958	327.5	313.2	193.0	192.7	197.3	22.1	23.3	26.5
1959	330.9	313.6	178.3	171.6	179.6	18.5	18.8	23.3
1960	313.9	299.6	168.2	163.2	169.4	14.0	14.9	19.1
1961	308.9	294.1	145.1	145.6	150.5	10.4	12.8	15.8
1962	304.4	[5] 289.1	135.4	[5] 138.8	143.8	8.6	[5] 11.6	14.0

[1] Bureau of Labor Statistics, Employment and Earnings, monthly issues.
[2] Bureau of Employment Security, Employment and Wages, monthly issues.
[3] Average, men working daily.
[4] Data not available.
[5] Preliminary figure.

Source: BLS data from Bureau of Labor Statistics, Employment and Earnings, monthly issues; BES data from Bureau of Employment Security, Employment and Wages, monthly issues; Bureau of Mines data from Bureau of Mines, Minerals Yearbook.

TABLE 18.—Total employment in the mineral-fuel industries, in thousands

(Thousands)

Year and month	Mining					Manufacturing		
	Total	Anthracite	Bituminous coal	Crude petroleum and natural gas products	Crude petroleum and natural gas (except contract services)[1]	Petroleum refining and related industries[2]	Petroleum refining	Other petroleum and coal products
1953–57 (average)	(3)	(3)	238.9	329.1	188.3	236.8	202.1	(3)
1958	542.6	22.1	193.0	327.5	192.5	223.8	190.4	23.8
1959	527.7	18.5	178.3	330.9	186.4	215.3	181.4	24.6
1960	496.1	14.0	168.2	313.9	181.7	211.7	177.6	24.6
1961	464.4	10.4	145.1	308.9	176.7	203.0	170.0	33.0
1962:								
January	458.7	9.3	144.7	304.7	173.9	197.6	165.5	32.1
February	455.5	9.1	144.0	302.4	173.2	197.6	165.2	32.4
March	450.7	9.1	140.1	301.5	173.2	197.1	164.8	32.3
April	448.5	8.9	137.6	302.0	173.8	198.3	165.0	33.3
May	449.0	9.1	135.9	304.0	174.9	199.3	164.6	34.7
June	450.7	8.6	134.2	307.9	177.5	200.9	165.3	35.6
July	440.0	9.2	120.7	310.1	178.0	200.9	165.0	35.9
August	451.1	8.5	133.4	309.2	178.0	199.9	163.5	36.4
September	449.8	8.4	134.2	307.2	175.5	192.8	156.4	36.2
October	446.8	8.6	135.2	303.0	172.8	190.7	154.9	35.8
November	442.3	8.8	133.4	300.1	172.1	195.0	163.1	31.9
December	441.4	8.6	131.6	301.2	171.6	186.9	153.5	33.4
Average, 1962	448.7	8.9	135.5	304.4	174.7	196.0	161.5	34.5

[1] Not included in total because data are also included with crude petroleum and natural gas production.
[2] Standard Industrial Classification Industry 295, paving and roofing materials included in total.
[3] Data not available.

Source: Bureau of Labor Statistics, Employment and Earning Statistics, Bulletin 1312. Revised.

TABLE 19.—Index of labor output

(1957–59=100)

Year	Petroleum refining			Bituminous coal and lignite mining		
	Employee	Production worker	Production worker man-hour	Employee	Production worker	Production worker man-hour
1952–56 (average)	84.4	82.8	83.7	82.3	78.9	79.1
1957	94.1	94.0	93.4	97.9	96.0	92.9
1958	97.4	97.2	98.0	97.2	97.7	103.2
1959	109.5	109.6	109.5	105.7	107.9	106.4
1960	113.5	115.2	113.0	113.0	116.4	114.3
1961	(1)	(1)	(1)	127.0	131.8	129.0

[1] Not available.

Source: Indexes of Output per Man-hour for Selected Industries, 1939 and 1947–61, Bureau of Labor Statistics.

TABLE 20.—Average hours and gross earnings of production workers in the mineral fuels and related industries

Year and month	Mining											
	Total fuels [1]			Total coal mining			Bituminous coal			Crude petroleum and natural gas		
	Weekly earnings	Weekly hours	Hourly earnings	Weekly earnings	Weekly hours	Hourly earnings	Weekly earnings	Weekly hours	Hourly earnings	Weekly earnings	Weekly hours	Hourly earnings
1953–57 (average)	(2)	(2)	(2)	(2)	(2)	(2)	$95.83	35.8	$2.67	(2)	(2)	(2)
1958	$99.72	38.5	$2.59	$95.70	33.0	$2.90	97.57	33.3	2.93	$100.62	42.1	$2.39
1959	106.53	39.9	2.67	109.03	35.4	3.08	111.70	35.8	3.12	103.52	42.6	2.43
1960	106.92	39.6	2.70	110.76	35.5	3.12	112.77	35.8	3.15	103.32	42.0	2.46
1961	108.62	39.8	2.72	111.34	35.8	3.11	112.73	35.9	3.14	105.75	41.8	2.53
1962:												
January	110.22	39.2	2.88	117.38	37.5	3.13	118.44	37.6	3.15	106.60	41.0	2.60
February	111.35	40.4	2.77	116.94	37.6	3.11	118.63	37.9	3.13	108.52	41.9	2.59
March	111.56	40.4	2.77	117.69	37.6	3.13	118.76	37.7	3.15	108.52	41.9	2.59
April	112.52	40.4	2.77	116.12	37.1	3.13	117.50	37.3	3.15	110.77	42.0	2.60
May	108.40	39.7	2.75	108.15	35.0	3.09	109.47	35.2	3.11	108.52	41.9	2.59
June	110.26	40.2	2.76	115.69	37.2	3.11	117.06	37.4	3.13	107.74	41.6	2.59
July	108.32	----------	----------	102.30	n.a.	n.a.	103.60	n.a.	n.a.	110.83	42.3	2.62
August	110.69	40.5	2.75	113.15	36.5	3.10	114.25	36.5	3.13	109.56	42.3	2.59
September	111.84	40.3	2.79	113.62	36.3	3.13	114.39	36.2	3.16	110.99	42.2	2.63
October	110.87	40.4	2.76	114.39	36.9	3.10	115.13	36.9	3.12	109.20	42.0	2.60
November	109.91	40.3	2.76	111.24	36.0	3.09	111.65	35.9	3.11	109.30	42.2	2.59
December	114.46	41.2	2.79	119.57	38.2	3.13	120.71	38.2	3.16	112.04	42.6	2.63
Average 1962	110.73	40.4	2.76	113.99	36.9	3.11	114.60	36.9	3.13	109.20	42.0	2.60

Year and month	Manufacturing								
	Petroleum refining and related industries			Petroleum refining			Other petroleum and coal products		
	Weekly earnings	Weekly hours	Hourly earnings	Weekly earnings	Weekly hours	Hourly earnings	Weekly earnings	Weekly hours	Hourly earnings
1953–57 (average)	$96.90	40.8	$2.37	$101.56	40.3	$2.52	(2)	(2)	(2)
1958	111.66	40.9	2.73	115.02	40.5	2.84	$94.60	43.0	$2.20
1959	117.42	41.2	2.85	121.99	40.8	2.99	97.61	43.0	2.27
1960	118.78	41.1	2.89	123.22	40.8	3.02	99.26	42.6	2.33
1961	124.42	41.2	3.02	129.24	40.9	3.16	102.10	42.9	2.38
1962:									
January	128.44	41.7	3.06	135.14	42.1	3.20	98.15	39.9	2.52
February	123.02	40.6	3.03	128.61	40.7	3.16	97.77	40.4	2.42
March	123.32	40.7	3.03	127.58	40.5	3.15	103.49	41.9	2.47
April	125.55	41.3	3.04	129.97	41.0	3.17	104.73	42.4	2.47
May	126.05	41.6	3.03	130.60	41.2	3.17	106.27	43.2	2.46
June	127.68	42.0	3.04	131.65	41.4	3.18	111.95	44.6	2.51
July	129.44	42.3	3.06	133.54	41.6	3.21	113.25	45.3	2.50
August	126.35	41.7	3.03	129.34	40.8	3.17	113.40	45.0	2.52
September	131.09	42.7	3.07	135.24	42.0	3.22	115.57	45.5	2.54
October	127.19	41.7	3.05	130.88	40.9	3.20	113.48	44.5	2.55
November	127.71	41.6	3.07	132.57	41.3	3.21	108.03	42.7	2.53
December	126.99	41.5	3.06	132.48	41.4	3.20	105.59	41.9	2.52
Average 1962	126.88	41.6	3.05	131.02	41.2	3.18	108.00	43.2	2.50

[1] Weighted average using employment as weight computed by author.

[2] Data not available.

Source: Bureau of Labor Statistics. Employment and Earnings Statistics, Bull. 1312; Employment and Earnings, June 1962.

TABLE 21.—Labor turnover rates, mineral fuels and related industries

(Per thousand employees)

Rates, year, and month	All manufacturing	Petroleum refining and related industries[1]	Petroleum refining	Coal mining
Total accession rate:				
1961 average	41	13	9	21
1962:				
January	41	14	7	18
February	35	12	8	14
March	37	17	9	16
April	40	15	9	16
May	43	16	10	18
June	50	27	21	12
July	45	15	10	14
August	51	17	10	25
September	49	15	9	25
October	39	12	7	17
November	30	8	6	15
December	24	6	5	14
Average, 1962	40	15	9	17
Total separation rate:				
1961 average	40	16	11	25
1962:				
January	39	14	12	21
February	34	16	9	21
March	36	15	11	18
April	36	15	12	21
May	38	16	14	45
June	38	16	14	34
July	44	15	12	52
August	52	25	20	23
September	50	27	21	20
October	43	18	14	26
November	40	22	12	32
December	38	21	15	18
Average, 1962	41	18	14	28
Layoff rate:				
1961 average	22	6	3	17
1962:				
January	21	5	2	14
February	17	8	2	14
March	16	7	4	9
April	16	5	3	10
May	16	5	4	37
June	16	3	3	26
July	22	5	3	42
August	23	6	4	14
September	19	7	5	10
October	22	6	3	17
November	23	10	2	22
December	25	9	2	11
Average, 1962	20	6	3	19

[1] Standard Industrial Classification industry 295, paving and roofing materials included in total.

Source: Bureau of Labor Statistics. Employment and Earnings, monthly issues.

PRICES AND COSTS

Value.—Two indexes, the index of average unit mine value and the index of implicit unit mine value, have been constructed in the Division of Economic Analysis to indicate the developments in the unit value of minerals. The two indexes measure value at different stages of fabrication. It is the aim of the index of average unit mine value to indicate changes in the return to the producer of the crude mineral at the point of production. Value added in transportation of the crude mineral and fabrication of it are excluded from this index. All segments of this index remained virtually unchanged in 1962.

The index of implicit unit value computes unit value at that stage of fabrication at which the value of mineral production (table 2) and index of physical volume (table 4) are measured. The stage of fabrication at which the minerals are measured varies from crude mineral through various stages of fabrication. This implicit index is derived by dividing the index of physical volume (table 4) into an index of value of production. An index of value was constructed specifically for the purpose of deriving the implicit value index. This value index measured the minerals at the same stage of fabrication as the physical volume index. The two fuels components of the index moved in opposite directions for the fourth consecutive year; coal was down about 2½ percent, whereas oil-gas component was up more than 1.5 percent. Comparing the movements of the two indexes it appears that for coal the value added after the coal leaves the mine is falling faster than the mine value, although both have been decreasing for 5 years. But in the case of the oil-gas component of the two indexes the value added beyond the point of production is increasing while the value at the point of production tends downward.

Prices.—The wholesale price index showed virtually no change for the fifth year in a row. The fuels component actually showed a slight decline in 1962 because of a drop in the wholesale price of coal. All other fuel prices were unchanged to slightly higher. The gas index, which as recently as 1960 increased 5 percent, showed only a 0.5 percent increase in 1962. The prices of the individual fuel items (table 25) showed little change during the year. The gas price at the well which advanced almost 8 percent in 1961 increased only 2.6 percent in 1962.

A new table (26) this year shows the price of electricity by region and by principal rate classes; the most recent year available is 1961. The table shows rates virtually unchanged in 1961. More significant than the rate changes in 1961 are the regional and class rate differentials. For the United States the residential rate is 70 percent higher than the industrial rate. And within each class the regional differences are even greater. The industrial rate varies from a low of 0.7 cent per kw.h. in the TVA area (east south central) to 2.1 cents per kw.h. in New England. The spread in the residential rate is not as large, but the highest rate, in New England, is twice the lowest rate, in east south central. An interesting analysis of the relationship between fuel costs, electricity price, and electricity consumption can be made by using the tables 30, 26, and 10.

Costs.—An index of major input expenses in anthracite, bituminous coal, and crude petroleum production has been constructed by the Division of Economic Analysis, Bureau of Mines. This index does not compare the actual costs of producing these fuels but only indicates the changes in operating costs for each since 1953. The categories of expense considered are labor, supplies, fuels, and purchased electricity. The weights are based on the 1958 Census of Mineral Industries. The labor input has been adjusted for productivity changes, using the data in table 22. These indexes do not include capital costs. A comparable index for metal mining is presented in the Review of the Mineral Industries in the first volume of the Minerals Yearbook.

Labor costs are the largest factor in the determination of the index of major input expenses, ranging from about 50 percent in petroleum to about 70 percent in anthracite. The decreasing costs in anthracite and bituminous coal have occurred in a period of increasing wage rates; wages in bituminous coal have risen two-thirds since 1950. However, the increased wages have been more than offset by productivity advances, thus reducing unit labor costs. This has not been the case in petroleum and natural gas. Although wage rates have risen less than the rates in bituminous coal, unit labor costs have increased because productivity advances have not kept pace with wage increases.

Relative Labor Cost.—The most important element in operating costs is wages and salaries. The index of relative labor costs adjusts average earnings by changes in productivity to indicate the direction of movement in real labor costs per dollar of product obtained. The changes in labor costs per ton and per dollar have been irregular but down in the coal industries since 1953, and reached a low point in 1962. In this same period, the real labor costs in the petroleum industry were rising through 1958, but they have shown a tendency to decrease since.

Machinery Prices.—The wholesale prices of items of machinery important in the mineral industries showed little change in 1962. Most of the items that changed at all increased slightly. There was only one decrease: air compressors.

Fuel Costs, Electricity Generation.—Table 30 shows the fuel cost in cents per million Btu of electric power generated for the major mineral fuels by regions of the United States. This table serves as an index of the price of the various fuels to a major consuming industry. 1962 data are not available.

TABLE 22.—Index of average unit mine value of minerals produced in the United States, by group and subgroup [1]

(1957-59=100)

Year	All minerals	Metals total	Nonmetals total	Fuels		
				Total	Coal	Crude oil and natural gas
1952	89	85	89	89	102	84
1953	93	88	93	93	103	89
1954	93	90	94	92	93	92
1955	94	101	95	92	92	92
1956	97	110	98	95	98	93
1957	102	101	99	102	103	102
1958	99	97	99	100	100	100
1959	98	102	101	98	97	98
1960	98	105	102	96	95	98
1961	98	103	102	97	93	99
1962	98	103	101	98	93	99

[1] For description of index see Review of Mineral Industries chapter in Minerals Yearbook, v. 1, 1959, pp. 22–24.

TABLE 23.—Index of implicit unit value of minerals produced in the United States, by group and subgroup [1]

(1957-59=100)

Year	All minerals	Fuels			Metals total	Nonmetals total
		Total	Coal	Crude oil and natural gas		
1952	84.2	84.9	100.9	81.6	79.0	86.0
1953	89.2	89.8	100.9	87.7	83.7	91.3
1954	90.7	90.7	92.9	91.1	85.6	94.3
1955	92.3	90.1	99.7	91.1	96.0	96.4
1956	96.1	92.8	97.7	92.2	110.8	99.4
1957	99.9	100.6	103.3	101.1	99.0	97.6
1958	99.7	100.0	99.2	100.1	96.7	99.7
1959	100.3	99.3	96.9	98.7	105.2	102.5
1960	101.4	100.2	95.0	99.9	106.4	100.3
1961	[2] 101.8	[2] 101.1	[2] 93.0	101.2	105.6	[2] 101.2
1962	102.0	101.2	90.7	102.9	103.0	101.2

[1] For description of index see Review of Mineral Industries chapter in Minerals Yearbook, 1961, v. 1, pp. 19-20.

[2] Revised figure.

TABLE 24.—Average monthly wholesale price indexes for selected fuels

(1957-59=100 unless otherwise specified)

Year and month	Wholesale price index, all commodities	Fuels and related products, and power [1]	Coal	Coke	Gas [2]	Electricity [2]	Crude petroleum and natural gasoline	Petroleum products, refined
1953-57	94.8	97.0	91.2	86.4	(2)	(2)	93.1	97.3
1958	100.4	98.7	99.7	98.4	101.7	100.4	101.1	97.0
1959	100.6	98.7	99.4	103.2	110.9	100.8	98.2	96.5
1960	100.7	99.6	98.8	103.6	116.6	101.9	97.7	97.6
1961	100.3	100.7	97.7	103.6	118.7	102.4	98.0	99.3
1962: [3]	100.6	100.2	96.8	103.6	119.2	102.8	98.1	98.2
January	100.8	101.0	98.7	103.6	118.1	102.5	98.2	99.6
February	100.7	100.4	98.7	103.6	122.0	103.0	98.2	97.8
March	100.7	98.9	98.7	103.6	119.4	103.1	98.2	95.3
April	100.4	100.2	95.3	103.6	115.3	103.0	98.2	98.9
May	100.2	99.7	94.6	103.6	116.6	102.9	98.2	97.9
June	100.0	99.6	94.6	103.6	113.8	102.8	98.2	98.1
July	100.4	100.0	95.3	103.6	119.7	102.8	98.2	98.0
August	100.5	99.5	95.6	103.6	117.8	102.8	98.2	97.2
September	101.2	100.8	96.6	103.6	120.1	102.8	98.2	99.2
October	100.6	100.8	97.2	103.6	122.7	102.7	98.1	98.9
November	100.7	100.8	97.7	103.6	122.3	102.7	98.1	98.9
December	100.4	100.8	98.3	103.6	123.1	102.7	98.1	98.6

[1] Formerly titled "Total fuels."

[2] Gas and electricity beginning January 1958; January 1958=100.

[3] Preliminary figure.

Source: Bureau of Labor Statistics, Monthly Labor Review.

TABLE 25.—Comparative fuel prices

Fuel	1961	1962
Bituminous coal:		
Average prices:		
Average retail price [1] .... dollars per net ton..	17.12	17.30
Cost of coal at merchant coke ovens .... do....	9.83	9.69
Anthracite, average sales realization per net ton at preparation plants, excluding dredge coal:		
Chestnut .... dollars..	11.36	11.49
Pea .... do....	9.65	9.63
Buckwheat No. 1 .... do....	8.55	8.39
Petroleum and petroleum products:		
Crude petroleum, average price per barrel at well .... do....	2.89	2.90
Gasoline, average dealers' net price (excluding taxes) of gasoline in 55 U.S. cities [2] cents per gallon..	15.80	15.45
Residual fuel oil:		
No. 6 fuel, average of high and low prices in Philadelphia [2] dollars per barrel (refinery)..	3.01	3.07
Bunker C, average price for all Gulf ports [2] .... do....	2.31	2.15
Distillate fuel oil:		
No. 2 distillate, average of high and low prices at Philadelphia [2] cents per gallon (refinery)..	9.85	9.82
No. 2 distillate, average price for all Gulf ports [2] .... do....	9.17	8.61
Natural gas:		
Average U.S. value at well .... cents per thousand cubic feet..	15.1	15.5
Average U.S. value at point of consumption .... do....	51.0	51.4

[1] Bureau of Labor Statistics published and unpublished data.
[2] Platt's Oil Price Handbook.

TABLE 26.—Cost of electrical energy per kilowatt hour

(Cents)

Region	1956			1957			1958		
	Total	Residential [1]	Commercial and industrial	Total	Residential [1]	Commercial and industrial	Total	Residential [1]	Commercial and industrial
New England	2.6	3.3	2.1	2.6	3.3	2.2	2.6	3.3	2.2
Middle Atlantic	2.0	3.0	1.6	2.0	3.0	1.7	2.1	3.0	1.7
East North Central	1.7	2.7	1.3	1.7	2.7	1.4	1.7	2.6	1.4
West North Central	2.4	3.0	1.9	2.3	3.0	1.9	2.4	3.0	1.9
South Atlantic	1.8	2.6	1.4	1.8	2.5	1.5	1.8	2.5	1.5
East South Central	.8	1.7	.6	.8	1.7	.6	.8	1.6	.6
West South Central	1.8	3.0	1.4	1.8	2.9	1.4	1.8	2.8	1.4
Mountain	1.5	2.3	1.2	1.5	2.3	1.2	1.6	2.3	1.2
Pacific	1.3	1.8	1.0	1.3	1.8	1.0	1.4	1.9	1.1
Total United States	1.6	2.6	1.3	1.7	2.5	1.3	1.7	2.5	1.3

Region	1959			1960			1961 [2]		
	Total	Residential [1]	Commercial and industrial	Total	Residential [1]	Commercial and industrial	Total	Residential [1]	Commercial and industrial
New England	2.6	3.2	2.1	2.5	3.2	2.1	2.5	3.1	2.1
Middle Atlantic	2.1	3.0	1.7	2.0	2.9	1.7	2.0	1.3	1.7
East North Central	1.7	2.6	1.4	1.7	2.7	1.4	1.7	2.6	1.4
West North Central	2.3	2.9	1.9	2.2	2.8	1.8	2.2	2.8	1.5
South Atlantic	1.8	2.4	1.5	1.8	2.4	1.5	1.8	2.3	1.5
East South Central	.8	1.6	.6	.8	1.5	.7	.9	1.5	.7
West South Central	1.8	2.8	1.4	1.8	2.7	1.4	1.8	2.7	1.5
Mountain	1.6	2.3	1.3	1.5	2.3	1.2	1.5	2.4	1.2
Pacific	1.4	1.8	1.1	1.4	1.8	1.1	1.4	1.9	1.1
Total United States [3]	1.7	2.5	1.3	1.7	2.4	1.3	1.7	2.4	1.4

[1] Includes rural.
[2] Rural included in all three classes.
[3] Includes Alaska and Hawaii for 1960 and 1961.

Source: Edison Electric Institute, Statistical Year Book of the Electric Utility Industry, 1956 to 1961.

TABLE 27.—Indexes of major input expenses adjusted for productivity, mineral-fuel mining

(1957-59=100)

Year	Anthracite	Bituminous coal	Crude petroleum and natural gas
1953	117	104	84
1954	99	94	88
1955	99	95	87
1956	96	99	91
1957	104	103	96
1958	102	98	103
1959	94	99	101
1960	88	96	100
1961	88	91	100
1962	(1)	88	99

(1) Discontinued series.

TABLE 28.—Indexes of relative labor cost, mineral fuel mining

(1957-59=100)

Year	Index of labor costs per unit of output [1]		Index of value of product per man-period [2]		Index of labor cost per dollar of product [3]	
	Bituminous	Petroleum	Bituminous	Petroleum	Bituminous	Petroleum
1953	111	81	72	90	111	90
1954	96	86	77	90	103	92
1955	96	85	79	94	103	92
1956	100	89	89	96	101	96
1957	104	95	96	105	101	92
1958	98	105	99	95	99	104
1959	98	101	105	100	100	104
1960	94	100	108	103	98	103
1961	86	100	114	108	92	103
1962	82	98	118	112	89	102

[1] Bituminous index based upon net tons per man per day (see coal chapter, this volume) and index of average earnings derived from Bureau of Labor Statistics data on hourly earnings; petroleum index based on barrels per year (see petroleum section, this volume) and Bureau of Employment Security data on total wages in petroleum production.

[2] Bituminous index based on net tons per man per day and mine values of production; petroleum index based on average employment and total value of production.

[3] Bituminous index of average earnings; petroleum index based on total value of production and total wages.

TABLE 29.—Wholesale price indexes—selected machinery and equipment items

(1957-59=100)

Year	Oilfield machinery and tools	Mining machinery and equipment	Power cranes, draglines, shovels, etc.	Construction machinery and equipment	Specialized construction machinery
1953–57 (average)	89.2	80.7	85.8	85.1	87.5
1958	100.1	100.2	99.9	100.1	100.0
1959	100.2	104.9	102.9	103.6	103.7
1960	100.3	106.4	105.1	105.8	106.9
1961	101.8	107.8	105.4	107.5	107.8
1962	103.2	108.4	106.1	107.8	107.4
	Portable air compressors	Scrapers and graders	Contractor's air tools, handheld	Mixers, pavers, spreaders, etc.	Tractors other than farm
1953–57 (average)	84.3	86.5	80.8	86.7	83.6
1958	100.2	99.6	98.9	99.9	100.4
1959	104.6	104.0	108.2	104.4	103.9
1960	105.4	104.7	108.2	106.7	106.4
1961	114.1	104.4	113.5	[1] 108.4	108.0
1962	113.7	105.3	113.5	110.3	108.5

[1] Revised figure.

Source: Bureau of Labor Statistics, U.S. Department of Labor.

TABLE 30.—Cost of fuel in steam-electrical power generation [1]

(Cents per million B.t.u.)

Region	Coal	Oil	Gas	Coal	Oil	Gas	Coal	Oil	Gas
	1956			1957			1958		
New England	38.8	41.4	37.9	41.0	46.9	40.7	40.1	40.7	37.8
Middle Atlantic	30.0	40.2	31.9	31.9	45.9	32.1	32.3	38.5	32.0
East North Central	24.6	74.3	21.7	25.8	68.2	23.1	25.8	68.5	24.6
West North Central	26.9	43.4	22.1	28.2	47.6	22.2	28.1	51.3	22.0
South Atlantic	28.1	39.5	25.2	29.0	46.2	25.8	28.6	39.7	27.6
East South Central	18.7	42.4	19.8	19.4	46.1	21.6	19.4	37.6	21.6
West South Central	15.2	40.4	12.4	14.9	41.7	12.9	15.6	41.8	12.9
Mountain	22.0	26.0	22.0	22.0	25.1	22.2	21.9	25.2	22.2
Pacific	------	33.0	25.0	------	41.5	26.5	------	42.0	26.5
Average, United States	26.2	37.9	18.5	27.5	44.4	19.5	27.4	39.6	19.5
	1959			1960			1961		
New England	37.7	35.8	34.5	36.5	36.0	35.6	36.2	37.7	36.3
Middle Atlantic	30.8	35.5	33.0	30.0	35.1	35.7	29.9	36.2	37.7
East North Central	25.6	73.2	[1] 24.5	25.3	65.5	[1] 25.3	25.0	64.7	26.4
West North Central	27.5	46.7	22.4	27.0	43.4	23.0	26.2	47.4	22.8
South Atlantic	27.2	35.5	29.7	26.3	35.6	31.8	25.8	35.2	32.5
East South Central	19.1	47.1	23.4	19.6	50.3	24.8	19.7	50.9	25.4
West South Central	15.8	43.2	15.0	32.3	45.1	16.7	------	43.8	19.0
Mountain	21.3	24.3	25.7	20.2	25.0	27.8	19.6	25.6	28.5
Pacific	------	34.8	32.0	------	32.3	33.4	------	32.6	35.2
Average, United States	26.5	35.2	22.3	26.0	34.5	23.8	25.8	35.5	25.1

[1] Excludes blast-furnace gas, which would lower cost slightly.

Source: Steam-Electric Plant Factors 1956 through 1961, National Coal Association.

INCOME AND INVESTMENT

National Income Originated.—The year 1962 was one of decline in income originated for all segments of the mining industry. This was in marked contrast to the experience of the rest of the economy where the total for all industries gained 6½ percent and the year-to-year change in manufacturing was more than 8½ percent. The declines in the mineral fuel related industries ranged from 7 percent in anthracite mining to 1½ percent in petroleum refining. The proportion of national income generated in the mineral fuels mining and processing industries has shown this tendency to grow slower than the total economy, or actually decline when the rest of the economy is growing, such as happened in 1962. Income originated consists of wages and salaries paid and profits generated in the industry.

Investment.—Data on total investment in fuels are not available. Table 28 presents data on direct private investments abroad in the petroleum industry. The only information available on book values of domestic investments is that contained in the statistical summary of balance-sheet data from corporate-income tax returns. These reports are issued after a delay of 2 years. Data are not yet available for 1962. As compared with a total book value of $12.2 billion in foreign investments at the end of 1961 for petroleum industries, the total book value of crude petroleum and products (including coal products) was $49.8 billion. (The figure for domestic investment for fiscal 1952 was $28.9 billion.) Of the total foreign investment of the petroleum industry, 45 percent is in three areas: Europe, Venezuela, and the Middle East. Information has become available on the value of direct foreign investment in the United States (table 33). The 1962 data are not available. Of the $7.4 billion total investment in 1961, 18 percent was invested in petroleum. Over half of this total was accounted for by the $.7 billion Netherlands' investment, and this was about two thirds of the total Netherlands' investment in the United States. The only other countries having significant petroleum investments in the United States are Canada and the United Kingdom. These three countries account for over 95 percent of the foreign investment in the domestic petroleum industry.

Indicated current rates of investment are given by figures on expenditures for new plant and equipment in the mining and manufacturing industries and by data on gross proceeds of new corporate security offerings. Expenditures by the mining industry for new plant and equipment showed a 10-percent gain over 1961. Investment by the petroleum and related industries increased about 7½ percent. This compares with an increase of about 4½ percent in all manufacturing.

TABLE 31.—National income by industrial origin in selected industries

Industry	1961 [1] (millions)	Change from 1960 (percent)	1962 (millions)	Change from 1961 (percent)
All industries	426,062	+2.8	453,695	+6.5
Mining	5,411	−1.8	5,218	−3.6
Metal mining	828	−5.2	774	−6.5
Anthracite mining	83	−6.7	77	−7.2
Bituminous and other soft coal mining	1,035	−9.2	1,006	−2.8
Crude petroleum and natural gas	2,656	+4.6	2,568	−3.3
Nonmetallic mining and quarrying	809	−6.9	793	−2.0
Manufacturing	120,129	− .7	130,546	+8.7
Products of petroleum and coal	3,886	−7.2	3,826	−1.5

[1] Revised figure.

Source: Office of Business Economics, U.S. Department of Commerce, Survey of Current Business, July 1963, table 7.

TABLE 32.—Direct private investment of the United States companies in foreign petroleum industries, 1962

(Million dollars; net inflows to the United States (−))

Country	Petroleum				All industries			
	Book value beginning of year	Net capital movements	Undistributed earnings of subsidiaries	Book value end of year	Book value beginning of year	Net capital movements	Undistributed earnings of subsidiaries	Book value end of year
Canada	2,831	312	33	2,834	11,614	132	368	12,131
Latin American Republics:								
Brazil	92	−15	1	79	1,008	14	67	1,088
Central America and West Indies; Mexico	200	29	17	245	1,815	5	129	1,935
Colombia	230	26	1	257	425	21	10	456
Mexico	48	16	3	67	826	45	24	873
Venezuela	2,368	−167	10	2,202	3,012	−194	29	2,826
Total	3,250	−115	43	3,159	8,255	−32	287	8,472
Dependencies in Western Hemisphere	419	46	20	485	954	62	40	1,056
Europe	2,153	208	5	2,365	7,713	811	299	8,843
Africa	498	116	17	627	1,058	145	45	1,246
Middle East	1,190	−11	1	1,148	1,243	−7	3	1,206
Far East	560	58	−6	612	1,234	85	31	1,289
Oceania	423	29	10	462	1,107	113	42	1,261
International enterprises	868	75	25	968	1,486	68	87	1,641
Grand total[1]	12,189	538	148	12,661	34,664	1,557	1,202	37,145

[1] Year end petroleum value adjusted $214 million, all industries adjusted $278 million because of valuation adjustments, transfer to other investment categories or areas, and profit or losses on liquidations.

Source: Office of Business Economics, U.S. Department of Commerce, Survey of Current Business, August 1963.

TABLE 33.—Value of foreign direct investments in the United States

(Millions of dollars)

Area and industry	1957	1958	1959	1960	1961
All areas:					
Total	5,710	6,115	6,604	6,910	7,392
Petroleum	1,043	1,099	1,184	1,238	1,325
United Kingdom:					
Total	1,881	2,024	2,167	2,248	2,484
Petroleum	271	283	316	339	381
Netherlands:					
Total	747	816	892	947	1,023
Petroleum	512	553	607	639	693
Other Europe:					
Total	1,125	1,230	1,393	1,512	1,622
Petroleum	49	49	49	50	51
Canada:					
Total	1,773	1,835	1,896	1,934	1,989
Petroleum	211	214	207	203	194
Other areas:					
Total	184	210	256	269	274
Petroleum	----------	----------	4	7	6

Source: Office of Business Economics, U.S. Department of Commerce, Foreign Business Investments in the United States.

TABLE 34.—Expenditures on new plant and equipment by firms in mining and selected mineral manufacturing industries

(Billion dollars)

	1960	1961	1962	1962			
				January March	April June	July September	October December
Mining [1]	0.99	0.98	1.08	0.26	0.27	0.28	0.27
Manufacturing:							
Primary iron and steel	1.60	1.13	1.10	.22	.28	.29	.31
Primary nonferrous metals	.31	.26	.31	.06	.07	.08	.10
Stone, clay, and glass products	.62	.51	.58	.12	.16	.14	.16
Chemical and allied products	1.60	1.62	1.56	.37	.40	.37	.43
Petroleum and coal products	2.64	2.76	2.88	.62	.69	.76	.80
Total manufacturing	14.40	13.68	14.68	3.14	3.69	3.72	4.13

[1] Including fuels.

Source: Office of Business Economics, U.S. Department of Commerce, Survey of Current Business, March 1962, p. 7; March 1963, p. 7.

TABLE 35.—Estimated gross proceeds of new corporate securities offered for cash in the United States in 1962 [1]

Type of security	Total corporate		Manufacturing		Mining [2]	
	Value (millions)	Percent	Value (millions)	Percent	Value (millions)	Percent
Bonds	9,016	84	2,880	88	146	65
Preferred stock	436	4	50	1	2	1
Common stock	1,318	12	353	11	77	34
Total	10,770	100	3,283	100	225	100

[1] U.S. Securities and Exchange Commission. Statistical Bulletin, v. 22, No. 6, June 1963, p. 11. Substantially all new issues of securities offered for cash sale in the United States in amounts over $100,000 and with terms to maturity of more than 1 year are covered in these data.

[2] Including fuels.

RESEARCH AND DEVELOPMENT

Funds.—Although money spent on research and development may be a minor part of the total expenditure of an industry, it is probably one of its most significant expenditures in terms of its future health and growth. The National Science Foundation collects information on research and development expenditures in industry and annually publishes the results, with accompanying analysis, in "Funds for Research and Development in Industry, and Scientific and Technical Personnel in Industry." Table 36 summarizes the data on funds expended in two mineral-fuels-related industries—chemicals and petroleum refining and extraction. For purposes of comparison, information on all industries is also shown.

Chemicals and petroleum accounted for about 13 percent of total research and development expenditures in 1961. Federal Government money accounted for almost 60 percent of total research and development expenditures in 1961, but these funds are concentrated in the aircraft and electrical-equipment industries. Only 10 percent of petroleum research and development expenditures were Federal funds. In the chemical industry the ratio of Government money was greater (19 percent), but it was still considerably less than the all-industries average. The National Science Foundation has found that it is the large companies in an industry who account for the bulk of research and development expenditures. In 1960, 88 percent of the research and development expenditures made by the petroleum industry were made by companies with more than 5,000 employees. In the chemicals industry, this figure was 82 percent.

Personnel.—About 1.4 million scientific and technical personnel were employed in industry in 1961. This includes part-time as well as full-time employees. Table 38 shows the full-time equivalent number of scientific and technical employees. The two series Tables 37 and 38 are not strictly comparable, but comparison of the two will give some idea of the relationship between "Persons employed" and "Full-time equivalent employees." The number of full-time equivalent number of persons (table 38) is about one-third the number of persons employed (table 37). Table 37 shows that the ratio of scientists and engineers to total technical personnel is higher in the chemicals industry (70 percent) than it is for all industries (23 percent). But the ratio is somewhat lower for petroleum refining (18 percent), and the gas industry ratio (11 percent) is only half of the all-industry ratio.

TABLE 36.—Research and development activity

	Funds expended (million dollars)						Percentage distribution of funds		
	Total		Company		Federal		1960		
	1960	1961	1960	1961	1960	1961	Basic	Applied	Development
Petroleum refining and extraction	298	308	272	276	26	32	18	40	41
Percent of all industries	2.8	2.8	6.1	6.1	0.4	0.4	---	---	---
Chemicals and allied products	998	1,092	816	874	182	218	12	42	46
Percent of all industries	9.4	10.0	18.4	19.6	2.9	3.3	---	---	---
All industries	10,546	10,891	4,419	4,455	6,127	6,436	4	20	76

Source: National Science Foundation. Funds for Research and Development in Industry, 1960 and 1961.

TABLE 37.—Scientific and technical personnel in industry

	Personnel employed		
	Total	Scientists and engineers	Technicians
Petroleum refining	86,700	15,700	71,000
Percent of all industries	6.2	1.9	12.4
Crude petroleum and natural gas mining	95,900	20,900	75,000
Percent of all industries	6.9	2.6	13.1
Coal mining	2,800	1,900	900
Percent of all industries	.2	.2	.2
Chemicals and allied products	129,300	91,200	38,100
Percent of all industries	9.3	11.2	6.7
All industries	1,387,700	814,800	572,900

Source: National Science Foundation, Scientific and Technical Personnel in Industry, 1961.

TABLE 38.—Full-time equivalent number of Research and Development scientists and engineers,[1] by industry, 1961 and 1962

Industry [2]	January 1961	January 1962	Percent change January 1961 to January 1962
Petroleum refining and extraction [3]	9,000	9,200	+2.2
Percent of all industries	3.0	2.9	−.1
Chemicals and allied products	34,300	36,300	+5.8
Percent of all industries	11.3	11.3	
All industries	304,400	319,900	+5.1

[1] Data on the employment of scientists and engineers include those engaged full time in research and development and the full-time equivalent of those working part time in research and development.
[2] Industries are arranged in accordance with their Standard Industrial Classification code numbers, as for example, food and kindred products 20; textiles and apparel 22 and 23.
[3] Geological and geophysical exploration activities of petroleum companies are excluded from the definition of research and development.

GOVERNMENT ACTIVITIES

Taxes.—On July 11, 1962, the Treasury issued new depreciation guidelines which allow companies greater flexibility than in the past in their depreciation policies for tax purposes. The new guidelines are not mandatory, but it is to the advantage of industry to use them. In 1962 the mineral industries claimed an additional $635 million in corporate depreciation allowances due to the new guidelines.

The Revenue Act of 1962 provided a tax credit for the purchase of machinery and equipment used in the United States. Unlike the new depreciation allowance which reduces taxable income in a particular year, the tax credit is applied as a reduction to taxes. By utilizing the tax credit the tax burden of the minerals industries was reduced almost $150 million in 1962.

Oil Import Program.—The mechanics of the import control program were changed by a Presidential proclamation of November 30. Actual domestic production will be used in the determination of the level of imports into Districts I–IV. In the past the import level was determined by total demand in the districts. District V regulations will continue as in the past. Imports of Mexican and Canadian crude are exempt from regulation, but the amount of these imports is subtracted from the total allowed imports to determine the level of regulated imports. The level of imports will be 12.2 percent of domestic crude production for the previous 6 months. Thus the quotas for the second half of a year will be determined by domestic production in the first half of the year.

National Fuels Study.—The final report of the National Fuels and Energy Study Group, "Assessment of Available Information on Energy in the United States," was submitted to the Senate Interior Committee in September. On the basis of this report, a Special Committee on the National Fuels Study, consisting of 12 Senators, will make its own report and policy recommendations to Congress. The present study group report submitted in September made no policy recommendations, but merely provided factual background and projected needs and resources.

Mine Water Control.—The terms of the State-Federal Conservation program to keep mines in the Pennsylvania anthracite region free of water were revised and extended by Public Law 87–818, October 1962, An amendment to Public Law 162—84th Congress July 1955.

Originally the program applied only to mine water control work. The new legislation has extended the scope of the program to include projects designed to insure public health and safety, such as work to fill voids in underground mines and to seal abandoned mines. The projects are conducted on a fund-matching basis with Pennsylvania.

WORLD REVIEW

U.S. Trade.—1962 was a year of increase for both exports and imports of mineral fuels and their products. Imports increased 9½ percent, while exports increased 5 percent. The new Standard International Trade Classification (SITC) system is used this year, and there are about half as many categories for the mineral fuels as in the former system. Although total fuel imports rose 9½ percent, imports of the two big components, crude fuel oil and petroleum products, increased 7.5 percent and 3.6 percent, respectively. The largest percentage increases were registered by gas and crude petroleum chemicals, the former almost doubling. Three items account for 90 percent of our exports: coal, petroleum products, and chemical manufactures. Exports of all three were increased, but the rates of change differed. Coal exports increased 11.8 percent; petroleum products, 5.6; and chemical products, 1.7 percent. Table 40 shows the regional distribution of mineral fuel imports and exports. Our principal coal export markets are Western Europe, Canada, and Japan, in that order. The principal sources of crude oil imports are Venezuela, Canada, and the Middle East, with Venezuela supplying more than the other two combined. Ninety-five (95) percent of petroleum product imports came from South America, and practically all gas imports originated in Canada.

World Production.—Table 41 shows world production, U.S. production, and U.S. consumption of the mineral fuels. It shows that the U.S. produced 30 percent of world crude oil and 15 percent of total world coal in 1962. This ratio is falling for oil but holding steady for coal. Statistics on world gas production are not available, but the U.S. produces a greater proportion of the world's gas than either coal or oil. The indexes of world production exclude the centrally planned economies. Crude oil and gas production increased in all regions, the fastest rate of advance being in Europe. Free world coal production increased 2 percent, with all areas except Latin America sharing in the advance. Production of coal in the USSR increased 1.2 percent, but it is estimated that production in Communist China did not change. Production by these two countries accounts for about one-third of total world production. Production of electricity in Western Europe amounts to about two-thirds of U.S. production but is increasing at a faster rate. U.S. production increased 7.5 percent in 1962, whereas the European growth rate was 8.8 percent. The United Kingdom and Western Germany account for almost half of European electricity production. European coal production is greater than U.S. production. Western Germany and the United Kingdom are the principal European producers of coal. Present production of crude petroleum and gas in Europe amounts to only about 4 percent of U.S. production. Coking coal production in Europe is almost twice U.S. production; German production almost equals U.S. production.

World Trade Prices.—Mineral fuel and product price indexes are shown in table 44. Most of the changes during the year were slight as downward pressure on fuels is maintained by ample supplies. The only significant price rise is the index of United Kingdom petroleum products, which has risen 17 percent in two years, about 5 percent of the increase occuring in 1962.

TABLE 39.—Value of imports and exports, mineral fuels and products [1]

(Thousand dollars)

SITC No.	Group	Imports for consumption [2]			Exports of domestic merchandise		
		1960	1961	1962	1960	1961	1962
321	Coal, coke, etc	3,733	3,283	4,187	361,609	348,104	388,710
331	Petroleum, crude, etc	950,802	998,288	1,071,650	8,032	8,541	5,110
332	Petroleum products	606,280	633,279	656,342	430,605	389,190	411,434
341	Gas, natural and manufactured	33,264	50,022	91,901	13,276	17,213	15,402
521	Tar, crude petroleum chemicals	30,298	29,505	46,757	51,461	69,641	67,501
599	Chemical material produced, n.e.s.	32,125	29,697	31,120	420,394	458,755	467,392
663	Mineral manufactures, n.e.s	8,905	8,132	14,366	58,396	58,415	62,556
	Total: Petroleum and related products	1,661,674	1,748,923	1,912,136	982,164	1,001,755	1,029,395
	Total fuels	1,665,407	1,752,206	1,916,323	1,343,773	1,349,859	1,418,105
	Total nonfuels (includes scrap but excludes wrought metals)	1,793,690	1,738,243	1,765,030	1,078,481	1,095,216	755,548
	Total minerals	3,459,097	3,490,449	3,681,353	2,422,254	2,445,075	2,173,653

[1] Grouping of commodities based upon Standard International Trade Classification of United Nations. Basic data for 1960 and 1961 compiled by Division of Economic Analysis, Bureau of Mines, from U.S. Commerce reports FT-110 and FT-410. 1962 data taken directly from FT-110 and FT-410.

[2] Includes items entered for immediate consumption, withdrawn from bonded storage warehouses for consumption, and withdrawn from bonded smelting and refining warehouses for consumption or export.

TABLE 40.—Regional distribution of imports and exports, mineral fuels and products[1]

(Thousand dollars)

SITC no.	Group	North America[2]	Latin America	Western Europe	Middle East	South and East Asia[3]	Other[4]
321	Coal, coke, etc.:						
	Imports	3,993	(5)	190	----------	1	1
	Exports	119,555	17,144	186,961	122	64,513	415
331	Petroleum, crude, etc.:						
	Imports	235,217	553,816	1,870	207,651	54,574	18,406
	Exports	25	----------	1,675	----------	3,410	--------
332	Petroleum products:						
	Imports	23,289	623,878	3,395	4,932	31	817
	Exports	49,480	69,145	112,351	9,926	124,799	45,489
341	Gas, natural and manufactured:						
	Imports	91.125	718	56	----------	2	--------
	Exports	14,200	736	240	4	55	117
521	Tar, crude petroleum chemicals:						
	Imports	7,558	28,479	8,894	120	455	1,226
	Exports	7,417	2,855	32,530	170	9,923	[6] 14,197
559	Chemical material produced, n.e.s.:						
	Imports	3,668	7,347	12,931	----------	209	6,965
	Exports	112,467	92,191	131,519	6,405	79,221	45,763
663	Mineral manufactures, n.e.s.:						
	Imports	1,890	332	8,971	50	3,034	39
	Exports	23,589	9,233	17,654	860	6,288	4,507
	Totals: Imports	366,740	1,214,570	36,307	212,753	58,306	27,423
	Exports	326,733	191,304	482,930	17,487	288,209	110,488

---

[1] Grouping of commodities based upon Standard International Trade Classification of United Nations. 1962 data compiled from U.S. Commerce reports FT-110 and FT-410.

[2] Includes Canada, Mexico, and Greenland.

[3] Includes from Afghanistan east to Japan, Taiwan, Philippines, Indonesia.

[4] Includes the Soviet bloc, Australia, New Zealand, other South Pacific islands, and Africa.

[5] Less than 0.5.

[6] Special category A included in figure.

TABLE 41.—World production; U.S. production and consumption

	World production	U.S. production		U.S. apparent consumption	
		Amount	Percent of world production	Amount	Percent of world production
			1961		
Crude petroleum........thousand barrels..	[1] 8,186,246	2,621,758	32	2,987.158	36
Natural gas..............million cubic feet..	(2)	13,254,025	(2)	13,081,714	(2)
Bituminous and lignite....thousand tons..	[1] 2,690,141	402,977	15	374,405	14
Anthracite...........................do....	[1] 189,900	17,446	9	15,900	8
			1962		
Crude petroleum........thousand barrels..	8,878,881	2,676,185	30	3.069,631	35
Natural gas..............million cubic feet..	(2)	13,876,622	(2)	13,890.129	(2)
Bituminous and lignite....thousand tons..	2,761,337	422,149	15	387,774	14
Anthracite...........................do....	191,900	16,894	9	15,000	8

---

[1] Revised figure.

[2] Data not available.

TABLE 42.—Index of world production: Coal, crude petroleum, and natural gas

(1958=100)

Year	Free world	North America [1]	Europe [2]	Latin America [3]	Asia [4]
	Coal				
1958	100	100	100	100	100
1959	97	100	96	100	100
1960	97	100	94	96	110
1961	96	96	92	111	117
1962 [5]	98	100	93	111	122
	Crude petroleum and natural gas				
1958	100	100	100	100	100
1959	107	105	121	108	112
1960	118	106	148	112	123
1961	128	108	172	115	133
1962 [5]	138	112	189	126	145

[1] Canada and United States.

[2] Excluding Albania, Bulgaria, Czechoslovakia, Eastern Germany, Hungary, Poland Romania, and U.S.S.R.

[3] Central and South America and Caribbean Islands.

[4] Afghanistan, Brunei, Burma, Ceylon, Singapore, and the Federation of Malaya, Hong Kong, India, Indonesia, Iran, Japan, Republic of Korea, Pakistan, Philippines, Sarawak, China (Taiwan), Thailand, and the Republic of Vietnam.

[5] Preliminary figure.

Source: UN Monthly Bulletin of Statistics, May 1963.

TABLE 43.—Monthly average of production of electricity and mineral fuels in selected OECD countries

Product	United States	European members OECD	United Kingdom	Germany, West	France	Italy	Spain	Netherlands	Belgium	Austria
Electric power (billion kw-hr.)										
1953	42.8	24.8	5.5	4.8	3.2	2.7	0.8	0.8	0.8	0.6
1954	45.4	27.4	6.1	5.2	3.6	3.0	.9	.8	.9	.6
1955	51.9	29.8	6.7	5.8	3.9	3.2	1.0	.9	.9	.7
1956	56.9	32.5	7.3	6.5	4.2	3.4	1.2	.10	.10	.8
1957	59.6	34.4	7.6	7.8	4.5	3.6	1.2	.11	.11	.8
1958	60.3	36.7	8.2	8.1	4.9	3.8	1.3	.11	.10	.9
1959	66.2	39.0	8.8	8.7	5.2	4.0	1.4	.12	.11	.10
1960	70.0	43.5	9.9	9.6	5.9	4.5	1.5	.13	.12	.11
1961	73.1	46.6	10.6	10.2	6.1	4.9	1.7	.14	.12	.11
1962	78.6	50.7	11.8	11.1	6.7	5.2	1.8	.15	.14	.12
Hard coal (million metric tons)										
1953	36.91	40.20	18.98	11.74	4.38	.09	1.02	1.03	2.51	--------
1954	31.69	40.60	18.97	12.07	4.53	.09	1.03	1.01	2.44	--------
1955	37.40	40.70	18.76	12.33	6.41	.10	1.03	.99	2.50	--------
1956	39.89	41.10	18.80	12.62	4.59	.09	1.07	.99	2.46	--------
1957	38.94	41.20	18.93	12.47	4.73	.09	1.16	.95	2.42	--------
1958	31.75	40.50	18.27	12.41	4.81	.06	1.20	.99	2.26	--------
1959	32.19	38.60	17.45	11.81	4.80	.06	1.14	1.00	1.90	--------
1960	32.39	37.50	16.46	11.86	4.66	.06	1.15	1.04	1.87	--------
1961	31.21	36.90	16.13	11.90	4.36	.05	1.15	1.05	1.79	--------
1962	33.03	37.10	16.80	11.76	4.36	.06	1.04	.96	1.77	--------
Crude petroleum (million metric tons)										
1953	26.54	.54	--------	.18	.03	.01	--------	.07	--------	.25
1954	26.09	.63	--------	.22	.04	.01	--------	.08	--------	.28
1955	27.98	.76	--------	.26	.07	.02	--------	.09	--------	.31
1956	29.48	.85	--------	.29	.11	.05	--------	.09	--------	.29
1957	29.49	.97	--------	.33	.12	.11	--------	.13	--------	.27
1958	27.57	1.01	--------	.37	.12	.13	--------	.14	--------	.24
1959	28.99	1.08	--------	.43	.14	.14	--------	.15	--------	.21
1960	29.00	1.19	--------	.46	.16	.17	--------	.16	--------	.20
1961	29.52	1.26	--------	.52	.18	.16	--------	.17	--------	.20
1962	30.14	1.33	--------	.57	.20	.15	--------	.18	--------	.20
Natural gas (billion cubic meters)										
1953	19.81	.26	--------	.01	.02	.19	--------	--------	--------	[1] .04
1954	20.63	.33	--------	.01	.02	.25	--------	--------	--------	[1] .04
1955	22.19	.41	--------	.02	.02	.30	--------	--------	--------	.06
1956	23.79	.49	--------	.03	.03	.37	--------	--------	--------	.06
1957	25.20	.56	--------	.03	.05	.42	--------	--------	--------	.06
1958	26.03	.62	--------	.03	.09	.43	--------	--------	--------	.07
1959	27.08	.85	--------	.03	.22	.51	--------	--------	--------	.09
1960	30.03	1.07	--------	.04	.37	.54	--------	--------	--------	.12
1961	30.91	1.24	--------	.04	.50	.57	--------	--------	--------	.13
1962	(2)	1.37	--------	.05	.58	.60	--------	--------	--------	.14
Coking coal (million metric tons)										
1953	6.0	6.74	1.48	3.46	.74	.20	.09	.27	.50	.13
1954	4.5	6.65	1.52	3.23	.79	.22	.10	.28	.51	.14
1955	5.7	7.42	1.53	3.72	.92	.25	.12	.33	.55	.15
1956	5.6	8.07	1.66	3.98	1.04	.28	.13	.35	.61	.17
1957	5.7	8.37	1.73	4.15	1.07	.31	.16	.35	.60	.18
1958	4.0	7.98	1.56	3.99	1.06	.28	.17	.34	.58	(2)
1959	4.1	7.54	1.44	3.57	1.12	.27	.20	.34	.60	(2)
1960	4.3	7.99	1.60	3.73	1.14	.31	.21	.38	.63	(2)
1961	3.9	7.85	1.51	3.71	1.10	.32	.22	.38	.60	(2)
1962	3.9	7.56	1.32	3.60	1.09	.36	.23	.37	.60	(2)
Lignite (million metric tons)										
1953	--------	8.02	--------	7.05	.16	.06	.15	--------	--------	.47
1954	--------	8.37	--------	7.32	.16	.05	.15	--------	--------	.52
1955	--------	8.64	--------	7.53	.17	.04	.15	--------	--------	.55
1956	--------	9.09	--------	7.94	.19	.03	.16	--------	--------	.56
1957	--------	9.03	--------	8.07	.19	.03	.21	--------	--------	.57
1958	--------	9.09	--------	7.79	.19	.07	.22	--------	--------	.54
1959	--------	9.07	--------	7.79	.18	.10	.18	--------	--------	.52
1960	--------	9.24	--------	7.98	.19	.06	.15	--------	--------	.50
1961	--------	9.45	--------	8.10	.24	.13	.17	--------	--------	.47
1962	--------	9.92	--------	8.47	.24	.15	.21	--------	--------	.47

---

[1] Producers' shipments.

[2] Not available.

Source: General Statistics, Organization for Economic Cooperation and Development. Statistical Bulletins, May 1963.

TABLE 44.—World-trade price indexes [1]

(1957-59=100)

Mineral	1956	1957	1958	1959	1960	1961	1962
Crude petroleum:							
Kuwait	96.7	101.2	104.0	94.9	92.2	89.4	89.4
Saudi Arabia	95.7	101.7	103.1	95.2	92.3	89.2	89.2
United Kingdom	103.0	112.8	98.2	89.1	84.4	81.1	79.9
United States:							
West-Texas Sour	92.6	101.4	101.4	97.2	96.9	101.6	101.1
Refugio-Light	92.1	104.0	99.6	96.6	96.6	96.6	96.6
Saudi Arabian	102.1	109.9	99.3	90.7	85.4	82.1	81.0
Venezuelan	95.8	103.8	102.0	94.3	92.2	91.6	91.3
Venezuela:							
Export prices f.o.b. Puerta La Cruz	94.2	102.1	102.5	95.5	94.1	94.1	94.1
Export price f.o.b. Amuay	92.8	102.5	102.9	94.5	92.8	92.8	92.8
Petroleum products:							
United Kingdom	91.1	110.7	94.0	95.4	98.3	110.5	115.4
U.S. distillate No. 2	99.6	107.4	95.1	97.4	91.7	98.5	95.1
U.S. gasoline	100.3	105.2	97.5	97.5	99.4	109.0	106.2
Coal:							
Canada	94.5	99.0	100.5	100.5	100.5	99.0	99.7
Germany	91.2	96.8	101.6	101.6	104.9	104.9	106.2
United Kingdom	112.8	122.3	98.4	79.4	72.2	71.4	n.a.
United States	94.1	103.0	100.1	96.8	95.6	[1] 93.6	91.7

[1] Revised figure.

Source: United Nations, Monthly Bulletin of Statistics, August 1963, table 51.

Employment and Injuries in the Fuel Industries

By Forrest T. Moyer

◆

Contents

	Page		Page
Introduction	41	Peat	44
Coal	41	Native asphalt	45
Coke	43	Conclusion	46
Oil and gas	44		

INTRODUCTION

THIS CHAPTER of the Minerals Yearbook contains injury experience and related employment information for the coal-mining, coking, oil and gas, peat, and native asphalt industries in the United States for 1962. Injury experience is measured by the number of injuries sustained per million man-hours of exposure in each industry. No attempt has been made to combine these data and present rates reflecting the mineral-fuel industries because the hazards of the separate industries are not comparable. Tabulations showing the trend of injuries and employment for all mineral industries are presented in volume III of the Minerals Yearbook.

COAL

The injury-frequency rate for the coal-mining industry of the United States increased less than 2 percent, according to reports received by the Bureau of Mines. The number of fatal and nonfatal injuries per million man-hours in 1962 was 45.86, based on final data for anthracite mines and preliminary data for bituminous coal and lignite mines.

Fatal injuries at all coal mines dropped 2 percent; the total of 287 killed was the lowest ever recorded for the industry. Two major disasters (a single accident resulting in the death of five men or more) occurred during 1962. A gas explosion in an Illinois mine on January 10 killed 11 men, while an explosion in a bituminous coal mine in Pennsylvania on December 6 killed 37 men. The number of nonfatal injuries (11,211) was virtually the same as in 1961 (11,197).

The average number of men working dropped 5 percent and, although active days increased from 194 in 1961 to 201 in 1962, total man-hours decreased approximately 2 percent.

Bituminous Coal Mines.—An increase of 3 percent was noted in the frequency rate of injuries at bituminous coal and lignite mines, based on preliminary data for 1962. Final data for 1961 showed a total of 10,177 fatal and nonfatal injuries, which occurred at a rate of 43.70 injuries per million man-hours, whereas 10,311 injuries in 1962 occurred at the rate of 44.82 per million man-hours.

Fatal injuries decreased 5 percent in 1962. Of the 261 fatalities in 1962, 225 occurred underground, 19 at surface operations, 16 at strip mines, and 1 at an auger mine. Roof- and face-fall accidents resulted in 105 deaths, 40 percent of the total for the industry; haulage accidents resulted in 44 fatal injuries, or 17 percent of the total. The Bureau of Mines estimated that 10,050 nonfatal lost-time injuries occurred in 1962, 1.5 percent more than in 1961.

Reductions of 4 percent in average annual employment and 1 percent in total man-hours were noted, while days active increased from 194 in 1961 to 200 in 1962.

TABLE 1.—Employment and injury experience at coal mines in the United States, 1958–62 [1]

Industry and year	Average men working daily [2]	Average active mine days [3]	Man-days worked (thousand)	Man-hours worked (thousand)	Number of injuries		Injury rate per million man-hours
					Fatal	Nonfatal	
Bituminous coal mines:[4]							
1958	198,350	183	36,260	286,758	326	12,036	43.11
1959	180,303	187	33,738	266,660	246	10,440	40.07
1960	170,628	190	32,417	257,075	290	10,501	41.98
1961	151,776	194	29,453	232,871	275	9,902	43.70
1962 [5]	145,100	200	29,069	230,050	261	10,050	44.82
Anthracite mines:							
1958	26,540	183	4,861	35,471	32	2,124	60.78
1959	23,294	173	4,036	29,371	47	1,723	60.26
1960	19,051	176	3,360	24,452	35	1,401	58.73
1961	15,792	196	3,098	22,424	19	1,295	58.60
1962	14,010	204	2,853	20,680	26	1,161	57.40
Total coal mines:							
1958	224,890	183	41,121	322,229	358	14,160	45.05
1959	203,597	186	37,773	296,031	293	12,163	42.08
1960	189,679	189	35,778	281,528	325	11,902	43.43
1961	167,568	194	32,551	255,296	294	11,197	45.01
1962 [5]	159,110	201	31,922	250,730	287	11,211	45.86

[1] Man-days and man-hours of employment have been rounded to the nearest thousand and will not necessarily add to the published total.

[2] Average number of men at work each day mine was active. Because absenteeism and labor turnover were considered, this number is lower than number of men available for work, as measured by a count of names on payroll.

[3] Average in which operating time of each mine is weighted by average number of workers in mines.

[4] Includes lignite.

[5] Bituminous data for 1962 are preliminary.

Anthracite Mines.—The injury rate per million man-hours (fatal and nonfatal) at Pennsylvania anthracite mines decreased 2 percent in 1962. Owing to an increase of 7 in the number of fatalities and a decrease of nearly 2 million man-hours, the rate of occurrence increased 48 percent over the 1961 rate. However, the number of nonfatal lost-time injuries and the frequency rate decreased 10 and 3 percent, respectively.

Of the 26 deaths recorded for the industry for 1962, 18 occurred underground (69 percent of the total), 2 at surface operations, 3 at stripping operations, and 3 at breakers. Culm bank and dredge operations had no fatalities. Eight of the underground deaths were caused by falls of roof, face, or rib, and five deaths resulted from suffocation. Haulage accidents were the third leading cause of deaths with four at all work locations, one less than in 1961.

The average number of men working and the total man-hours decreased 11 and 8 percent, respectively. Each man worked an average of 1,476 hours during the year, 4 percent more than in 1961. The number of active days increased from 196 in 1961 to 204 in 1962, a 4-percent increase. The average workday of 7.24 hours in 1961 increased slightly to 7.25 hours in 1962.

COKE

The overall injury-frequency rate of the coking industry in 1962 was 37 percent higher than that of 1961. There were eight more fatalities, and the frequency occurrence was 263 percent greater than in 1961. There were 59 more nonfatal injuries, and the frequency rate increased 33 percent. There were 3 percent fewer operating ovens than in 1961, and the cumulative man-hours decreased 2 percent. The medial operating time of plants increased 5 days over that of 1961, and each man averaged 2,867 hours during the year while working an 8-hour shift.

Slot Ovens.—Nine fatalities and 94 percent of all nonfatal injuries reported in the coke industry occurred at slot ovens. The combined frequency rate of fatal and nonfatal injuries at these ovens rose 47 percent over the 1961 rate. Employment and man-hours of worktime decreased 3 and 2 percent, respectively; however, employees averaged 4 workdays more than in 1961 and produced 1.475 tons of coke per man-hour. Working an 8-hour shift, these men averaged 1 percent more hours than in 1961. There was no work stoppage in 1962.

TABLE 2.—Employment and injury experience at coke ovens in the United States, 1958–62 [1]

Industry and year	Average men working daily [2]	Average active plant days [3]	Man-days worked (thousand) [4]	Man-hours worked (thousand) [4]	Number of injuries		Injury rate per million man-hours
					Fatal	Nonfatal	
Slot ovens:							
1958	15,654	359	5,616	44,970	5	190	4.34
1959	15,865	337	5,354	42,782	3	183	4.35
1960	15,779	360	5,673	45,353	3	177	3.97
1961	13,106	359	4,707	37,661	3	167	4.51
1962	12,723	363	4,623	36,969	9	237	6.65
Beehive ovens:							
1958	532	125	67	516	----------	20	38.76
1959	780	145	113	844	----------	39	46.20
1960	684	139	95	712	----------	46	64.57
1961	428	196	84	645	----------	26	40.33
1962	357	191	68	533	2	15	31.89
All ovens:							
1958	16,186	351	5,683	45,486	5	210	4.73
1959	16,645	328	5,467	43,626	3	222	5.16
1960	16,463	350	5,768	46, 66	3	223	4.91
1961	13,534	354	4,791	38,306	3	193	5.12
1962	13,080	359	4,691	37,502	11	252	7.01

---

[1] All data are final.

[2] Average number of men at work each day oven was active. Because absenteeism and labor turnover are taken into consideration, this number is lower than the number of men available for work, as measured by a count of names on payroll.

[3] Average in which operating time of each plant is weighted by average number of workers in the plant.

[4] Man-days and man-hours of employment have been rounded to the nearest thousand and will not necessarily add to published totals.

Beehive Ovens.—Two fatalities reported for 1962 were the first in 9 years. Both were caused by cars, lorries, and motors and both occurred in Pennsylvania. However, there were 21 percent fewer combined fatal and nonfatal injuries, because nonfatal injuries declined 42 percent. Both the number of employees and their hours of worktime dropped 17 percent in 1962, while ovens were active 5 days less. Employees worked an average of 1,493 hours and the average length of shift at beehive ovens was 7.8 hours in 1962.

OIL AND GAS

A 7-percent increase in the number of injuries in the oil and gas industry, coupled with a 3-percent increase in worktime, resulted in a 4-percent increase of fatal and nonfatal injuries per million man-hours of exposure. Severity of injuries increased 4 percent in 1962, owing principally to a 9-percent rise in the number of reported fatal and permanent total injuries. The number of permanent partial injuries increased 10 percent, and the number of temporary total injuries increased 7 percent.

The nonfatal injuries consisted of 464 permanent partial injuries and 8,872 temporary total injuries, with an average time-loss charge of 41 days. Average severity has remained static for these combined groups since 1960. However, the time-loss charge for all injuries, including fatal and permanent total injuries, was 117 days, 1 day more than in 1961.

Five segments of the industry improved their injury experience: Production, natural gasoline, marine transportation (ocean), marine transportation (inland), and miscellaneous. The severity rate of injuries was improved in the following four departments: Natural gasoline, pipeline gas, refining, and marketing. Only natural gasoline showed improvement in both frequency and severity.

TABLE 3.—Employment and injury experience in the oil and gas industry of the United States, 1958–62

Year	Average men working daily	Man-hours worked (thousand)	Number of injuries		Injury rate per million man-hours
			Fatal[1]	Nonfatal	
1958	584,708	1,215,722	116	11,588	9.63
1959	559,244	1,185,146	120	10,543	9.00
1960	511,107	1,063.332	82	9,110	8.64
1961	452.721	951,743	111	8,697	9.25
1962	469,256	984,172	121	9,336	9.61

[1] Fatal and permanent total injuries combined.

PEAT

The injury-frequency rate for extracting and processing peat was 19.46 disabling work injuries per million man-hours of exposure. Nonfatal injuries increased 12 percent in number and 19 percent in frequency. No fatal injury has occurred in the industry since 1959. Reports were received from 120 active operations in 23 States, indicating a 5-percent decrease in operations when compared with the

126 reports received for 1961. The plants operated for 169 days, 8 percent more than in 1961, and each man worked an average of 1,430 hours, a 5-percent increase over the 1961 average. A total of 683 employees accumulated 0.98 million man-hours of worktime. Employment decreased 11 percent, and man-hours decreased 6 percent in 1962.

The 19 nonfatal injuries reported for the industry caused a loss of 293 days, or 15 days per injury. These time-loss data show a marked improvement; in 1961, 775 days were lost for an average of 46 days per injury. The leading cause of injuries was machinery accidents with six injuries, or 32 percent of the total followed by handling materials with four injuries, haulage with three, slips and falls of persons with two, miscellaneous with two, falling objects with one, and stepping on sharp objects with one.

TABLE 4.—Employment and injury experience in the peat industry in the United States, 1958–62

Year	Average men working daily	Man-hours worked (thousand)	Number of injuries		Injury rate per million man-hours
			Fatal	Nonfatal	
1958	464	704	----------	12	17.05
1959	467	738	1	14	20.33
1960	576	866	----------	24	27.72
1961	765	1,038	----------	17	16.38
1962	683	977	----------	19	19.46

NATIVE ASPHALT

The safety record of the native asphalt industry of the United States improved by more than 100 percent in 1962 compared with the 1961 record. Thirteen nonfatal lost-time injuries occurred at a rate of 16.25 per million man-hours; in 1961 a total of 31 injuries (including 1 fatality) resulted in a frequency rate of 39.17.

Of the 13 injuries, 8 occurred underground, 1 at an opencut mine and 4 at processing plants. Mill auxiliaries and surface operations at underground mines were injury-free during the year. The leading cause of disabling injuries was slips or falls of persons; five injuries (38 percent of the total) resulted from this kind of accident. Haulage and material-handling accidents caused three injuries each, while handtools and falling or sliding material or objects accounted for one each.

The average workforce dropped 7 percent, but, owing to an increase of 23 days of activity, the number of man-hours increased 1 percent.

TABLE 5.—Employment and injury experience at bituminous limestone, bituminous sandstone, and gilsonite mines and mills in the United States, 1960–62 [1]

Year	Average men working daily	Average active days	Man-days worked (thousands)	Man-hours worked (thousands)	Number of injuries		Injury rate per million man-hours
					Fatal	Nonfatal	
1960	445	264	117	948	1	38	41.16
1961	383	256	98	792	1	30	39.17
1962	358	279	100	800		13	16.25

---

[1] Prior to 1960, these data were published with the nonmetals industry in volume I of the Minerals Yearbook.

CONCLUSION

The overall injury-frequency rate increased in 1962 for each of the fuel industries, with the exception of native asphalt. Active mine or plant days are requested from the coal, coke, and native asphalt industries only. In each of these industries, average operating time increased. Annual average employment continued to decline in all but the oil and gas industry.

Coal and Related Products

Coal—Bituminous and Lignite

By W. H. Young,[1] R. L. Anderson,[2] and R. J. Phillips[3]

❖

Contents

	Page
General summary	47
Scope of report	48
Reserves	50
Thickness of bituminous coal and lignite seams	52
Domestic production	54
Production by months and weeks	58
Summary by States	64
Number and size of mines	67
Employment and productivity	70
Underground mining	72
Strip mining	84
Auger mining	99
Mechanical loading	101
Mechanical cleaning	109
Mechanical crushing	114
Domestic production—Continued	
Treatment for allaying dust	116
Thermal drying	119
Production by States and counties	121
Transportation	134
Consumption	138
Distribution	141
Relative rate of growth of mineral fuels and waterpower	151
Stocks	151
Prices	153
Lignite	155
Foreign trade	155
World production	160
Coal technology	162

GENERAL SUMMARY

THE BITUMINOUS coal and lignite industry increased substantially in 1962, compared with the 1961 figures. The major items of production, consumption, exports, and productivity increased. However, certain key items declined. The steady upward trend in mechanization failed to materialize for the third year; the percentage of total tonnage mechanically loaded remained the same as in the 2 previous years; and the tonnage mechanically cleaned was smaller than in the previous year. The percentage of total production mined by stripping and by augers increased slightly. Most significant was the continued decline in average value and employment.

Production.—The output of bituminous coal and lignite in the United States in 1962—422 million tons—was 5 percent greater than the 403 million tons produced in 1961. Production was greater in 1962, owing largely to expanded consumption by the electric utilities and to more exports.

The major seasonal fluctuation in production, as in the past, resulted from the miners' vacation period of 12 days in midsummer. According to the Bureau of Labor Statistics, U.S. Department of Labor, time lost because of strikes totaled 191,000 man-days in 1962, compared with 91,000 in 1961.

Trend of Employment.—Employment decreased 4 percent.

---

[1] Chief, Section of Bituminous Coal and Lignite, Division of Coal.
[2] Mining engineer, Division of Coal.
[3] Supervisory statistical assistant, Division of Coal.

Index to Capacity.—As it is impossible for all mines to operate every working day in the year, an estimate of 280 days for calculating potential capacity was suggested some years ago by the coal committee of the American Institute of Mining, Metallurgical and Petroleum Engineers. The average output per day worked in 1962 was 2.1 million tons, which, if applied to 280 days, gives an annual potential output of 594 million tons, compared with the actual production of 422 million tons. This figure is not a measure of practical productive capacity of the industry because railroad coal car availabilities and other factors bearing on the ability of the industry to produce are not reflected in this computation.

Mechanization.—Coal output that was loaded mechanically at underground mines in the United States—86 percent—was the same as in 1960 and 1961.

Mechanical Cleaning.—Approximately 64 percent of the bituminous coal and lignite mined in the United States in 1962 was mechanically cleaned. The growth of mechanical cleaning closely paralleled that of mechanical mining, partly because more refuse was loaded with the coal. Moreover, the bituminous coal and lignite industry has attempted to meet the consumer demand for cleaner coal. A large part of the remaining 36 percent was handpicked and screened into various sizes at tipples where no mechanical cleaning facilities existed.

Consumption.—Consumption of bituminous coal and lignite in the United States increased 4 percent, principally in electric utilities. The remaining principal types of consumers used substantially the same amount of coal as in the previous year or used slightly less.

Trends of Fuel Efficiency.—For the first time in many years, the fuel efficiency of electric-power utilities failed to make a new record; instead, it remained at 0.86 pounds per kilowatt-hour, the same as in 1961.

Competition With Oil and Gas.—Although consumption of energy has increased steadily since 1920, the proportion supplied by bituminous coal and lignite has decreased consistently as a result of serious competition from oil and gas. Of total energy consumed in 1962, bituminous coal and lignite furnished 22 percent; anthracite, 1 percent; oil, 43 percent; gas, 30 percent; and waterpower, 4 percent.

Electric utilities consumed 6 percent more bituminous coal, 8 percent more gas, and 0.1 percent less fuel oil in 1962.

Stocks.—The reserve supply of bituminous coal and lignite in the hands of industrial consumers and retail coalyards decreased from 71 million tons at the beginning of the year to 70 million tons at the end of the year. Stocks remained the same—a 59-day supply. Stocks on the upper lake docks decreased 144,320 tons from January 1 to December 31, 1962.

Exports.—Exports totaled 38 million tons, increasing 10 percent over those of 1961; 27 million tons was shipped overseas and 11 million tons to Canada.

SCOPE OF REPORT

These data include all coal produced in the United States except Pennsylvania anthracite, Texas lignite, and bituminous coal and lignite mines that produced less than 1,000 tons per year.

Throughout the chapter all tonnage figures show net tons of marketable coal and exclude washery and other refuse. "Tons" refers to net or short tons of 2,000 pounds.

Statistics for 1962 are final and are based upon detailed annual reports of production and mine operation furnished by producers. All but a small percentage of the output was covered by the reports submitted. For production not directly reported (chiefly that of small mines), accurate data were obtained from the records of the various State mine departments (which have statutory authority to require such reports) or in a few instances, from railroad carloadings. Thus, complete coverage of all mines producing 1,000 tons a year or more is reported. Inclusion of many small mines that produce less than 1,000 tons per year was not attempted.

From 1955 to 1962 the annual production form did not request information on employment. These figures for men working daily, days worked, man-days worked, and tons per man per day were obtained from the Accident Analysis Branch of the Bureau of Mines.

Statistical procedures are also detailed in the following sections: Production by Months and Weeks, Number and Size of Mines, Mechanical Cleaning, Production by States and Counties, Consumption, and Stocks.

TABLE 1.—Salient statistics of the bituminous coal and lignite industry in the United States

Item	1961	1962	Change from 1961 (percent)
Production ... net tons	402,976,802	422,149,325	+4.8
Consumption ... do	374,405,000	387,774,000	+3.6
Stocks at end of year:			
Industrial consumers and retail yards ... do	71,418.000	69,691.000	−2.4
Stocks on upper lake docks ... do	3,031,230	2,886,910	−4.8
Imports and exports:[1]			
Imports ... do	164.259	232,424	+41.5
Exports ... do	34,969,825	38,413,424	+9.8
Price indicators, average per net ton:			
Cost of coking coal at merchant coke ovens	$9.83	$9.69	−1.4
Retail price[2]	$17.12	$17.30	+1.1
Railroad freight charge[3]	$3.40	[4] $3.37	[4]−.9
Value f.o.b. mines	$4.58	$4.48	−2.2
Equipment sold:			
Mobile loading machines	84	113	+34.5
Continuous-mining machines	115	149	+29.6
Augers	18	15	−16.7
Shuttle cars	214	186	−13.1
Conveyors:			
Gathering and haulage	111	171	+54.1
Room or transfer	66	58	−12.1
Method of mining:			
Hand loaded underground ... net tons	37,416,063	40,345,901	+7.8
Mechanically loaded underground ... do	235,349,922	240,920,467	+2.4
Percentage of total underground production mechanically loaded	86.3	85.7	−.7
Mined by stripping ... net tons	121,979,084	130,300,224	+6.8
Mined at auger mines ... do	8,231,733	10,582.733	+28.6
Mechanically cleaned ... do	264,710,942	271,632,599	+2.6
Number of mines	7,648	7,740	+1.2
Average number of days worked[5]	193	199	+3.1
Average number of men working daily[5]	150,474	143,822	−4.4
Production per man per day[5] ... net tons	13.87	14.72	+6.1
Fuel efficiency indicator: Pounds of coal per kilowatt-hour at electric powerplants[6]	0.86	0.86	----------

[1] Bureau of the Census, U.S. Department of Commerce.

[2] Bureau of Labor Statistics, U.S. Department of Labor.

[3] Interstate Commerce Commission.

[4] Represents first 6 months only.

[5] Accident Analysis Branch, Federal Bureau of Mines.

[6] Federal Power Commission.

RESERVES

TABLE 2.—Coal reserves of the United States, January 1, 1960, by States

(Million short tons)

State	Date of publication of estimate	Estimated original reserves				Total	Reserves depleted to Jan. 1, 1960		Remaining reserves, Jan. 1, 1960	Recoverable reserves, Jan. 1, 1960 assuming 50 percent recovery
		Bituminous coal	Subbituminous coal	Lignite	Anthracite and semianthracite		Production [1]	Production plus loss in mining [2]		
ALABAMA [3]	(4)	[5] 13,754	---	20	---	[5] 13,774	[6] 23	[6] 46	13,728	6,864
ALASKA	(7)	21,401	[8] 71,136	(8)	2,101	94,638	13	26	94,612	47,306
ARKANSAS	1960	1,816	---	350	456	2,622	99	198	2,424	1,212
COLORADO	1959	63,203	18,492	---	90	81,785	506	1,012	80,773	40,387
GEORGIA	1953	100	---	---	---	100	12	24	76	38
ILLINOIS	1953	137,329	---	---	---	[9] 137,329	[10] 474	[10] 948	136,381	68,190
INDIANA	1953	37,293	---	---	---	37,293	1,148	2,296	34,997	17,499
Iowa [11]	1909	29,160	---	---	---	29,160	357	714	28,446	14,223
KANSAS	B–1951 L–1952	[9] 20,774	---	(12)	---	[9] 20,774	[10] 13	[10] 26	20,748	10,374
KENTUCKY	(4)	72,318	---	---	---	72,318	2,646	5,292	67,026	33,513
MARYLAND	1953	[9] 1,200	---	---	---	[9] 1,200	[10] 6	[10] 12	1,188	594
MICHIGAN	1950	297	---	---	---	297	46	92	205	102
Missouri	1913	79,362	---	---	---	79,362	287	574	78,788	39,394
MONTANA	1949	2,363	132,151	87,533	---	222,047	171	342	221,705	110,853
NEW MEXICO	1950	10,948	50,801	---	6	61,755	125	250	61,505	30,753
NORTH CAROLINA	1955	112	---	---	---	112	1	2	110	55
NORTH DAKOTA	1953	---	---	350,910	---	350,910	96	192	350,718	175,359
OHIO	1960	46,488	---	---	---	46,488	2,052	4,104	42,384	21,192
OKLAHOMA	1957	3,673	---	(12)	---	3.673	180	360	3,313	1,656
OREGON	1955	20	180	---	---	200	3	6	194	97
PENNSYLVANIA	B–1928 A–1945	75,093	---	---	22,805	97,898	13,508	27,016	70,882	35,441
SOUTH DAKOTA	1952	---	---	2,033	---	2,033	1	2	2,031	1,015
TENNESSEE	1959	[13] 1,912	---	---	---	[13] 1,912	[14] 6	[14] 12	1,900	950
TEXAS [15]	B–1909 L–1955	8,000	---	7,070	---	15,070	95	190	14,880	7,440

UTAH	(7)	28,222	156			28,378	260	520	27,858	13,929
VIRGINIA	1952	11,696			355	12,051	782	1,564	10,487	5,244
Washington	1929	11,413	[8] 52,442	(8)	23	63,878	149	298	63,580	31,790
WEST VIRGINIA	1940	116,618				116,618	6,369	12,738	103,880	51,940
WYOMING	1950	13,235	[8] 108,319	(8)		121,554	402	804	120,750	60,375
Other States		[16] 620	[17] 4,065	[18] 50		4,735	7	14	4,721	2,360
Total		808,420	437,742	447,966	25,836	1,719,964	[19] 29,837	59,674	1,660,290	830,145

---

[1] Production, 1800 through 1885, from "The first century and a quarter of American coal industry," by H. N. Eavenson, privately printed, Pittsburgh, 1942; production, 1886 through 1923, from U.S. Geological Survey Mineral Resources, annual volumes; production, 1924, through 1957, from U.S. Bureau of Mines, Minerals Yearbook, annual volumes, augmented for some States by records of State mine inspectors; production, 1958, from U.S. Bureau of Mines, Mineral Market Summary 2974, Sept. 9, 1959; production, 1959, from U.S. Bureau of Mines weekly coal reports and partly estimated.

[2] Assuming past losses equal past production.

[3] Reserve estimates of States in capital letters supersede earlier estimates of M. R. Campbell.

[4] New estimate from report in preparation or in press.

[5] Remaining reserves, Jan. 1, 1958.

[6] Production 1958 and 1959 only.

[7] New estimate presented for first time in this report.

[8] Small reserves and production of lignite included under subbituminous coal.

[9] Remaining reserves, Jan. 1, 1950

[10] Production 1950 through 1959.

[11] Reserve estimates of States in lowercase letters were prepared by or under the direction of M. R. Campbell before 1928.

[12] Small reserves of lignite in beds generaly less than 30 inches thick.

[13] Remaining reserves, Jan. 1, 1959.

[14] Estimated production 1959 only.

[15] New estimate of lignite reserves; Campbell estimate of bituminous coal reserves.

[16] ARIZONA, CALIFORNIA, Idaho, Nebraska, and Nevada.

[17] ARIZONA, CALIFORNIA, and Idaho.

[18] CALIFORNIA, Idaho, Louisiana, and Nevada.

[19] Less than total recorded production of about 34.8 billion tons. See footnotes 5, 6 9, 10, 13, and 14.

Source: Averitt, Paul. Coal Reserves of the United States—A Progress Report January 1, 1960. Geol. Survey Bull. 1136, 1961, pp. 10–11.

THICKNESS OF BITUMINOUS COAL AND LIGNITE SEAMS

The Bureau of Mines compiled and published detailed data on thickness of seams for coal mines in 1960.[4] Because of the importance of seam thickness in mining, these data for 1960 follow. See also figure 1.

TABLE 3.—Number and production of bituminous coal and lignite mines in the United States, 1960, classified by thickness of seams mined

Item	Less than 2 feet	2 to 3 feet	3 to 4 feet	4 to 5 feet	5 to 6 feet	6 to 7 feet	7 to 8 feet	8 feet and over	Total
Number of mines:									
Underground	35	1,811	2,178	990	449	266	132	128	5,989
Strip	140	510	418	222	106	52	22	60	1,530
Auger	3	71	129	94	40	8	--------	1	346
Total	178	2,392	2,725	1,306	595	326	154	189	7,865
Percentage of mines:									
Underground	0.6	30.2	36.4	16.5	7.5	4.5	2.2	2.1	100.0
Strip	9.2	33.3	27.3	14.5	6.9	3.4	1.5	3.9	100.0
Auger	.9	20.4	37.3	27.2	11.6	2.3	--------	.3	100.0
Total	2.3	30.4	34.6	16.6	7.6	4.1	2.0	2.4	100.0
Production (thousand tons):									
Underground	231	20,851	65,322	49,633	53,928	39,833	29,665	25,425	284,888
Strip	5,660	19,503	32,934	30,456	17,692	7,126	3,546	5,713	122,630
Auger	44	939	2,781	2,965	971	235	--------	59	7,994
Total	5,935	41,293	101,037	83,054	72,591	47,194	33,211	31,197	415,512
Percentage of production:									
Underground	0.1	7.3	22.9	17.4	19.0	14.0	10.4	8.9	100.0
Strip	4.6	15.9	26.9	24.8	14.4	5.8	2.9	4.7	100.0
Auger	.5	11.7	35.0	37.1	12.1	2.9	--------	.7	100.0
Total	1.4	9.9	24.3	20.0	17.5	11.4	8.0	7.5	100.0

---

[4] Young, W. H., and R. L. Anderson. Thickness of Bituminous Coal and Lignite Seams Mined in 1960 BuMines Inf. Circ. 8118, 1962, 19 pp.

TABLE 4.—Number of mines, production, output per man per day, and average thickness of seams mined, at underground, strip, and auger bituminous coal and lignite mines in the United States, 1960, by States

State	Underground mines				Strip mines				Auger mines				Total, all mines			
	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)	Number of mines	Production (net tons)	Average output per man per day (tons)	Average thickness of seams mined (feet)
Alabama	135	10,365,340	7.80	4.1	39	2,558,414	14.96	2.8	3	86,893	26.32	2.7	177	13,010,647	8.66	3.8
Alaska	2	66,982	6.01	30.9	6	655,489	15.43	34.6	-------	-------	-------	-------	8	722,471	13.47	34.3
Arizona	2	5,526	2.02	5.5	-------	-------	-------	-------	-------	-------	-------	-------	2	5,526	2.02	5.5
Arkansas	10	112,774	4.24	2.6	10	296,425	13.38	1.8	-------	-------	-------	-------	20	409,199	8.39	2.0
Colorado	87	2,914,437	8.06	7.6	7	692,849	28.46	8.4	-------	-------	-------	-------	94	3,607,286	9.34	7.8
Georgia	2	4,215	1.84	1.5	-------	-------	-------	-------	-------	-------	-------	-------	2	4,215	1.84	1.5
Illinois	59	23,306,901	17.38	7.5	69	22,670,585	30.04	5.0	-------	-------	-------	-------	128	45,977,486	21.94	6.3
Indiana	34	4,752,902	11.96	5.8	47	10,784,967	29.50	4.6	-------	-------	-------	-------	81	15,537,869	20.36	5.0
Iowa	19	200,100	4.51	4.9	25	867,924	18.15	4.5	-------	-------	-------	-------	44	1,068,024	11.58	4.6
Kansas	2	3,584	2.41	2.1	11	884,690	17.11	1.5	-------	-------	-------	-------	13	888,274	16.70	1.5
Kentucky	1,630	44,468,474	10.61	4.3	129	19,672,192	36.16	4.9	105	2,705,826	30.30	4.1	1,864	66,846,492	13.86	4.5
Maryland	48	260,198	4.37	3.2	37	487,636	15.51	4.3	-------	-------	-------	-------	85	747,834	8.22	3.9
Missouri	10	88,273	3.06	3.6	23	2,801,937	11.83	2.2	-------	-------	-------	-------	33	2,890,210	10.88	2.2
Montana (bituminous and lignite)	14	115,993	6.17	6.6	5	197,430	37.34	16.6	-------	-------	-------	-------	19	313,423	13.01	12.9
New Mexico	18	249,762	6.32	6.3	1	45,000	45.00	3.0	-------	-------	-------	-------	19	294,762	7.27	5.8
North Dakota (lignite)	1	2,403	7.30	9.0	31	2,522,552	37.07	11.0	-------	-------	-------	-------	32	2,524,955	36.93	11.0
Ohio	149	9,206,400	10.95	4.9	265	23,883,289	23.59	3.7	56	867,083	42.45	3.8	470	33,956,772	18.13	4.0
Oklahoma	11	247,568	3.10	3.4	15	1,093,965	16.34	1.7	-------	-------	-------	-------	26	1,341,533	9.14	2.0
Pennsylvania	680	44,070,560	9.04	5.5	553	20,875,533	17.03	3.2	49	479,172	18.53	3.6	1,282	65,425,265	10.68	4.8
South Dakota (lignite)	-------	-------	-------	-------	1	20,448	10.10	4.5	-------	-------	-------	-------	1	20,448	10.10	4.5
Tennessee	332	3,938,626	6.70	4.2	71	1,763,913	20.97	2.9	12	227,911	25.93	3.7	415	5,930,450	8.71	3.8
Utah	45	4,954,693	10.71	10.8	-------	-------	-------	-------	-------	-------	-------	-------	45	4,954,693	10.71	10.8
Virginia	1,201	25,819,830	9.44	5.6	35	1,370,864	26.77	4.1	32	647,201	33.04	3.5	1,268	27,837,895	9.92	5.5
Washington	9	211,968	6.30	7.8	1	16,177	9.77	2.9	-------	-------	-------	-------	10	228,145	6.46	7.5
West Virginia	1,479	109,209,989	11.78	5.1	140	6,754,001	13.65	4.9	89	2,980,287	34.30	4.6	1,708	118,944,277	12.07	5.1
Wyoming	10	310,812	7.60	7.5	9	1,713,384	39.20	45.9	-------	-------	-------	-------	19	2,024,196	23.93	40.0
Total	5,989	284,888,310	10.64	5.4	1,530	122,629,664	22.93	5.1	346	7,994,373	31.36	4.2	7,865	415,512,347	12.83	5.3

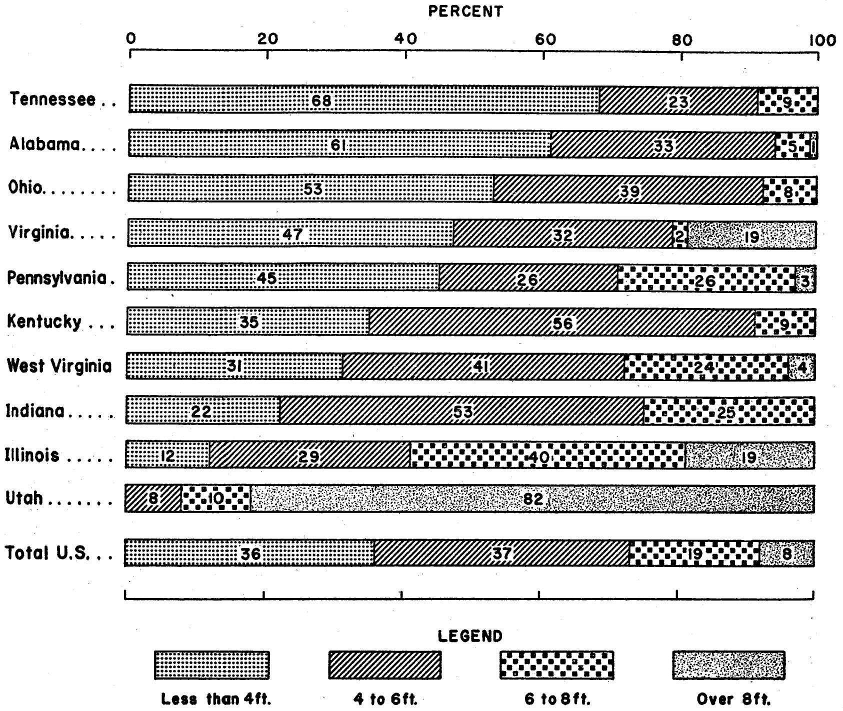


FIGURE 1.—Percentage of bituminous coal and lignite produced in the 10 leading coal-producing States and total United States, 1960, by thickness of seams mined.

DOMESTIC PRODUCTION

TABLE 5.—Growth of the bituminous coal and lignite mining industry in the United States

Year	Production (net tons)	Value of production		Number of mines	Capacity at 280 days (million tons)	Foreign trade [1]	
		Total	Average per ton			Exports (net tons)	Imports (net tons)
1890	111,302,322	$110,420,801	$0.99	(2)	137	1,272,396	1,047,416
1891	117,901,238	117,188,400	.99	(2)	148	1,651,694	1,181,677
1892	126,856,567	125,124,381	.99	(2)	162	1,904,556	1,491,800
1893	128,385,231	122,751,618	.96	(2)	174	1,986,383	1,234,499
1894	118,820,405	107,653,501	.91	(2)	196	2,439,720	1,286,268
1895	135,118,193	115,779,771	.86	2,555	196	2,659,987	1,411,323
1896	137,640,276	114,891,515	.83	2,599	202	2,515,838	1,393,095
1897	147,617,519	119,595,224	.81	2,454	213	2,670,157	1,442,534
1898	166,593,623	132,608,713	.80	2,862	221	3,004,304	1,426,108
1899	193,323,187	167,952,104	.87	3,245	230	3,897,994	1,409,838
1900	212,316,112	220,930,313	1.04	(2)	255	6,060,688	1,911,925
1901	225,828,149	236,422,049	1.05	(2)	281	6,455,085	2,214,507
1902	260,216,844	290,858,483	1.12	(2)	316	6,048,777	2,174,393
1903	282,749,348	351,687,933	1.24	(2)	350	5,835,561	4,043,519
1904	278,659,689	305,397,001	1.10	4,650	386	7,206,879	2,179,882

See footnotes at end of table.

TABLE 5.—Growth of the bituminous coal and lignite mining industry in the United States—Continued

Year	Production (net tons)	Value of production		Number of mines	Capacity at 280 days (million tons)	Foreign trade[1]	
		Total	Average per ton			Exports (net tons)	Imports (net tons)
1905	315, 062, 785	$334, 658, 294	$1. 06	5, 060	417	7, 512, 723	1, 704, 810
1906	342, 874, 867	381, 162, 115	1. 11	4, 430	451	8, 014, 263	2, 039, 169
1907	394, 759, 112	451, 214, 842	1. 14	4, 550	473	9, 869, 812	1, 892, 653
1908	332, 573, 944	374, 135, 268	1. 12	4, 730	482	11, 071, 152	2, 219, 243
1909	379, 744, 257	405, 486, 777	1. 07	5, 775	510	10, 101, 131	1, 375, 201
1910	417, 111, 142	469, 281, 719	1. 12	5, 818	538	11, 663, 052	1, 819, 766
1911	405, 907, 059	451, 375, 819	1. 11	5, 887	538	13, 259, 791	1, 972, 555
1912	450, 104, 982	517, 983, 445	1. 15	5, 747	566	16, 475, 029	1, 456, 333
1913	478, 435, 297	565, 234, 952	1. 18	5, 776	577	18, 013, 073	1, 767, 656
1914	422, 703, 970	493, 309, 244	1. 17	5, 592	608	17, 589, 562	1, 520, 962
1915	442, 624, 426	502, 037, 688	1. 13	5, 502	610	18, 776, 640	1, 703, 785
1916	502, 519, 682	665, 116, 077	1. 32	5, 726	613	21, 254, 627	1, 713, 837
1917	551, 790, 563	1, 249, 272, 837	2. 26	6, 939	636	23, 839, 558	1, 448, 453
1918	579, 385, 820	1, 491, 809, 940	2. 58	8, 319	650	22, 350, 730	1, 457, 073
1919	465, 860, 058	1, 160, 616, 013	2. 49	8, 994	669	20, 113, 536	1, 011, 550
1920	568, 666, 683	2, 129, 933, 000	3. 75	8, 921	725	38, 517, 084	1, 244, 990
1921	415, 921, 950	1, 199, 983, 600	2. 89	8, 038	781	23, 131, 166	1, 257, 589
1922	422, 268, 099	1, 274, 820, 000	3. 02	9, 299	832	12, 413, 085	5, 059, 999
1923	564, 564, 662	1, 514, 621, 000	2. 68	9, 331	885	21, 453, 579	1, 882, 306
1924	483, 686, 538	1, 062, 626, 000	2. 20	7, 586	792	17, 100, 347	417, 226
1925	520, 052, 741	1, 060, 402, 000	2. 04	7, 144	748	17, 461, 560	601, 737
1926	573, 366, 985	1, 183, 412, 000	2. 06	7, 177	747	35, 271, 937	485, 666
1927	517, 763, 352	1, 029, 657, 000	1. 99	7, 011	759	18, 011, 744	549, 843
1928	500, 744, 970	933, 774, 000	1. 86	6, 450	691	16, 164, 485	546, 526
1929	534, 988, 593	952, 781, 000	1. 78	6, 057	679	17, 429, 298	495, 219
1930	467, 526, 299	795, 483, 000	1. 70	5, 891	700	15, 877, 407	240, 886
1931	382, 089, 396	588, 895, 000	1. 54	5, 642	669	12, 126, 299	206, 303
1932	309, 709, 872	406, 677, 000	1. 31	5, 427	594	8, 814, 047	186, 909
1933	333, 630, 533	445, 788, 000	1. 34	5, 555	559	9, 036, 947	197, 429
1934	359, 368, 022	628, 383, 000	1. 75	6, 258	565	10, 868, 552	179, 661
1935	372, 373, 122	658, 063, 000	1. 77	6, 315	582	9, 742, 430	201, 871
1936	439, 087, 903	770, 955, 000	1. 76	6, 875	618	10, 654, 959	271, 798
1937	445, 531, 449	864, 042, 000	1. 94	6, 548	646	13, 144, 678	257, 996
1938	348, 544, 764	678, 653, 000	1. 95	5, 777	602	10, 490, 269	241, 305
1939	394, 855, 325	728, 348, 366	1. 84	5, 820	621	11, 590, 478	355, 115
1940	460, 771, 500	879, 327, 227	1. 91	6, 324	639	16, 465, 928	371, 571
1941	514, 149, 245	1, 125, 362, 836	2. 19	6, 822	666	20, 740, 471	390, 049
1942	582, 692, 937	1, 373, 990, 608	2. 36	6, 972	663	22, 943, 305	498, 103
1943	590, 177, 069	1, 584, 644, 477	2. 69	6, 620	626	25, 836, 208	757, 634
1944	619, 576, 240	1, 810, 900, 542	2. 92	6, 928	624	26, 032, 348	633, 689
1945	577, 617, 327	1, 768, 204, 320	3. 06	7, 033	620	27, 956, 192	467, 473
1946	533, 922, 068	1, 835, 539, 476	3. 44	7, 333	699	41, 197, 378	434, 680
1947	630, 623, 722	2, 622, 634, 946	4. 16	8, 700	755	68, 666, 963	290, 141
1948	599, 518, 229	2, 993, 267, 021	4. 99	9, 079	774	45, 930, 133	291, 337
1949	437, 868, 036	2, 136, 870, 571	4. 88	8, 559	781	27, 842, 056	314, 980
1950	516, 311, 053	2, 500, 373, 779	4. 84	9, 429	790	25, 468, 403	346, 706
1951	533, 664, 732	2, 626, 030, 137	4. 92	8, 009	736	56, 721, 547	292, 378
1952	466, 840, 782	2, 289, 180, 401	4. 90	7, 275	703	47, 643, 150	262, 268
1953	457, 290, 449	2, 247, 943, 799	4. 92	6, 671	670	33, 760, 263	226, 900
1954	391, 706, 300	1, 769, 619, 723	4. 52	6, 130	603	31, 040, 564	198, 799
1955	464, 633, 408	2, 092, 382. 737	4. 50	7, 856	620	51, 277, 256	337, 145
1956	500, 874, 077	2, 412, 004, 151	4. 82	8, 520	655	68, 552, 629	355, 701
1957	492, 703, 916	2, 504, 406, 042	5. 08	8, 539	680	76, 445, 529	366, 506
1958	410, 445, 547	1, 996, 281, 274	4. 86	8, 264	625	50, 293, 382	306, 940
1959	412, 027, 502	1, 965, 606, 901	4. 77	7, 719	614	37, 253, 431	374, 713
1960	415, 512, 347	1, 950, 425, 049	4. 69	7, 865	609	36, 541, 075	260, 495
1961	402, 976, 802	1, 844, 562, 662	4. 58	7, 648	585	34, 969, 825	164, 259
1962	422, 149, 325	1, 891, 554, 474	4. 48	7, 740	594	38, 413, 424	232, 424

See footnotes at end of table.

TABLE 5.—Growth of the bituminous coal and lignite mining industry in the United States—Continued

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines [3]	Mechanically loaded	Mechanically cleaned [4]	Mined by stripping
1890	192,204	226	(2)	2.56	579	(2)	(2)	(2)	(2)
1891	205,803	223	(2)	2.57	573	5.3	(2)	(2)	(2)
1892	212,893	219	(2)	2.72	596	(2)	(2)	(2)	(2)
1893	230,365	204	(2)	2.73	557	(2)	(2)	(2)	(2)
1894	244,603	171	(2)	2.84	486	(2)	(2)	(2)	(2)
1895	239,962	194	(2)	2.90	563	(2)	(2)	(2)	(2)
1896	244,171	192	(2)	2.94	564	11.9	(2)	(2)	(2)
1897	247,817	196	(2)	3.04	596	15.3	(2)	(2)	(2)
1898	255,717	211	(2)	3.09	651	19.5	(2)	(2)	(2)
1899	271,027	234	46	3.05	713	22.7	(2)	(2)	(2)
1900	304,375	234	43	2.98	697	24.9	(2)	(2)	(2)
1901	340,235	225	35	2.94	664	25.6	(2)	(2)	(2)
1902	370,056	230	44	3.06	703	26.8	(2)	(2)	(2)
1903	415,777	225	28	3.02	680	27.6	(2)	(2)	(2)
1904	437,832	202	44	3.15	637	28.2	(2)	(2)	(2)
1905	460,629	211	23	3.24	684	32.8	(2)	(2)	(2)
1906	478,425	213	63	3.36	717	34.7	(2)	2.7	(2)
1907	513,258	234	14	3.29	769	35.1	(2)	2.9	(2)
1908	516,264	193	38	3.34	644	37.0	(2)	3.6	(2)
1909	543,152	209	29	3.34	699	37.5	(2)	3.8	(2)
1910	555,533	217	89	3.46	751	41.7	(2)	3.8	(2)
1911	549,775	211	27	3.50	738	43.9	(2)	(2)	(2)
1912	548,632	223	35	3.68	820	46.8	(2)	3.9	(2)
1913	571,882	232	36	3.61	837	50.7	(2)	4.6	(2)
1914	583,506	195	80	3.71	724	51.8	(2)	4.8	0.3
1915	557,456	203	61	3.91	794	55.3	(2)	4.7	.6
1916	561,102	230	26	3.90	896	56.9	(2)	4.6	.8
1917	603,143	243	17	3.77	915	56.1	(2)	4.6	1.0
1918	615.305	249	7	3.78	942	56.7	(2)	3.8	1.4
1919	621,998	195	37	3.84	749	60.0	(2)	3.6	1.2
1920	639,547	220	22	4.00	881	60.7	(2)	3.3	1.5
1921	663,754	149	23	4.20	627	66.4	(2)	3.4	1.2
1922	687,958	142	117	4.28	609	64.8	(2)	(2)	2.4
1923	704.793	179	20	4.47	801	68.3	0.3	3.8	2.1
1924	619,604	171	73	4.56	781	71.5	.7	(2)	2.8
1925	588.493	195	30	4.52	884	72.9	1.2	(2)	3.2
1926	593,647	215	24	4.50	966	73.8	1.9	(2)	3.0
1927	593.918	191	153	4.55	872	74.9	3.3	5.3	3.6
1928	522,150	203	83	4.73	959	76.9	4.5	5.7	4.0
1929	502,993	219	11	4.85	1,064	78.4	7.4	6.9	3.8
1930	493,202	187	43	5.06	948	81.0	10.5	8.3	4.3
1931	450,213	160	35	5.30	849	83.2	13.1	9.5	5.0
1932	406,380	146	120	5.22	762	84.1	12.3	9.8	6.3
1933	418,703	167	30	4.78	797	84.7	12.0	10.4	5.5
1934	458,011	178	15	4.40	785	84.1	12.2	11.1	5.8
1935	462,403	179	[4] 7	4.50	805	84.2	13.5	12.2	6.4
1936	477,204	199	21	4.62	920	84.8	16.3	13.9	6.4
1937	491,864	193	[5] 19	4.69	906	(2)	20.2	14.6	7.1
1938	441,333	162	13	4.89	790	87.5	26.7	18.2	8.7
1939	421,788	178	36	5.25	936	87.9	31.0	20.1	9.6
1940	439.075	202	8	5.19	1,049	88.4	35.4	22.2	9.2
1941	456,981	216	27	5.20	1,125	89.0	40.7	22.9	10.7
1942	461,991	246	7	5.12	1,261	89.7	45.2	24.4	11.5
1943	416,007	264	[5] 15	5.38	1,419	90.3	48.9	24.7	13.5
1944	393,347	278	[5] 5	5.67	1,575	90.5	52.9	25.6	16.3
1945	383,100	261	[5] 9	5.78	1,508	90.8	56.1	25.6	19.0
1946	[6] 396.434	214	[5] 23	6.30	1,347	90.8	58.4	26.0	21.1
1947	[6] 419,182	234	[5] 5	6.42	1,504	90.0	60.7	27.7	22.1
1948	[6] 441,631	217	[5] 16	6.26	1,358	90.7	64.3	30.2	23.3
1949	[6] 433,698	157	[5] 15	6.43	1,010	91.4	67.0	35.1	24.2

See footnotes at end of table.

TABLE 5.—Growth of the bituminous coal and lignite mining industry in the United States—Continued

Year	Men employed	Average number of days worked	Average days lost per man on strike	Net tons per man—		Percentage of underground production—		Percentage of total production—	
				Per day	Per year	Cut by machines[3]	Mechanically loaded	Mechanically cleaned[4]	Mined by stripping
1950	[6] 415,582	183	[5] 56	6.77	1,239	91.8	69.4	38.5	23.9
1951	[6] 372,897	203	[5] 4	7.04	1,429	93.4	73.1	45.0	22.0
1952	[6] 335,217	186	[5] 6	7.47	1,389	92.8	75.6	48.7	23.3
1953	[6] 293,106	191	[5] 3	8.17	1,560	92.3	79.6	52.9	23.1
1954	[6] 227,397	182	[5] 4	9.47	1,724	88.8	84.0	59.4	25.1
1955	[6] 225,093	210	[5] 4	9.84	2,064	88.1	84.6	58.7	24.8
1956	[6] 228,163	214	[5] 4	10.28	2,195	84.6	84.0	58.4	25.4
1957	[6] 228,635	203	[5] 3	10.59	2,155	80.9	84.8	61.7	25.2
1958	[6] 197,402	184	[5] 3	11.33	2,079	75.3	84.9	63.1	28.3
1959	[6] 179,636	188	[5] 24	12.22	2,294	72.1	86.0	65.5	29.4
1960	[6] 169,400	191	[5] 4	12.83	2,453	67.8	86.3	65.7	29.5
1961	[6] 150,474	193	[5] 4	13.87	2,678	64.7	86.3	65.7	30.3
1962	[6] 143,822	199	[5] 6	14.72	2,935	63.3	85.7	64.3	30.9

[1] Figures for 1890–1914 represent fiscal year ended June 30. [2] Data not available.

[3] Percentages for 1890–1913 are of total production, as a separation of underground and strip production is not available for these years.

[4] Percentages for 1906–26 are exclusive of coal cleaned at central washeries operated by consumers.

[5] Bureau of Labor Statistics, U.S. Department of Labor.

[6] Average number of men working daily.

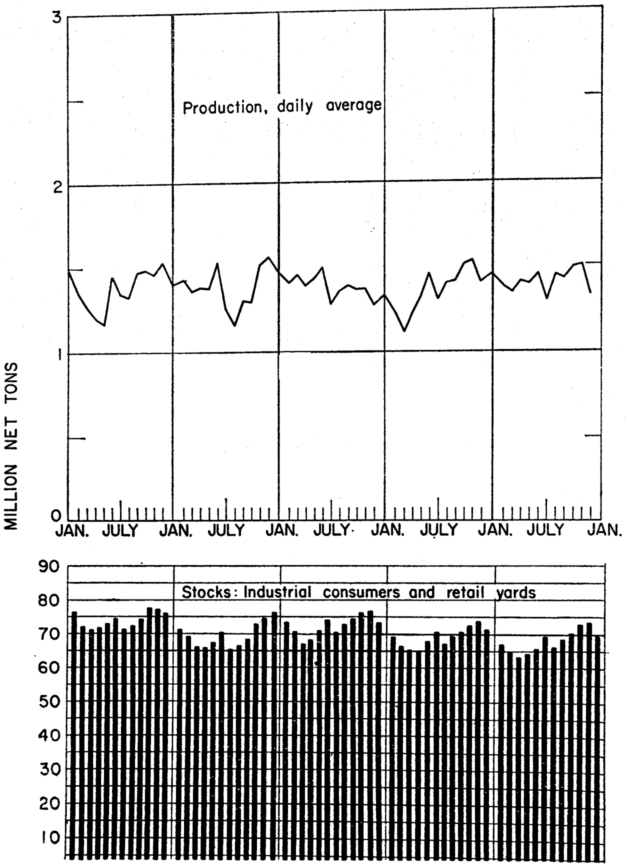


FIGURE 2.—Trends of production and stocks of bituminous coal and lignite in the United States, 1958–62.

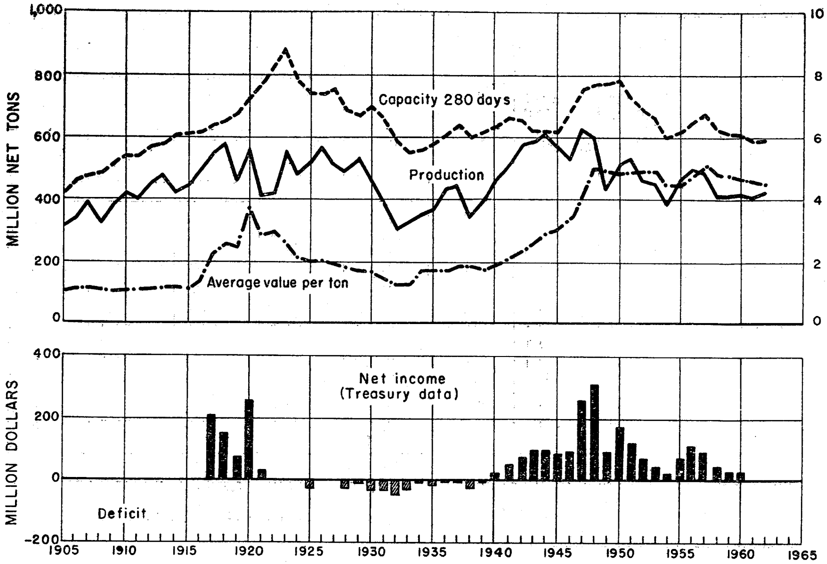


FIGURE 3.—Trends of bituminous coal and lignite production, realization, mine capacity, and net income or deficit in the United States, 1905–62.

PRODUCTION BY MONTHS AND WEEKS

The figures on monthly and weekly production are estimates based upon (1) railroad carloadings of coal reported daily and weekly by all important carriers, (2) shipments on the Allegheny and Monongahela Rivers reported by the U.S. Army Engineers, (3) direct reports from mining companies, and (4) monthly production statements compiled by certain local operators associations and State mine departments. In computing the estimates, allowance is made for commercial truck shipments, local sales, colliery fuel, and small truck mines producing over 1,000 tons a year.

Preliminary estimates are made currently and published in the Weekly Coal Reports. These preliminary estimates have proved very reliable and for many years have been within approximately 1 percent of the final figure of total production, based upon complete coverage of all mines producing over 1,000 tons a year. The preliminary estimates are later revised to agree with the final total production based on the canvass. Thus, the monthly and weekly estimates of production, summarized in tables 6–9, represent final figures and vary slightly from the preliminary figures of production published in the Weekly Coal Reports. See also figures 2, 4, and 5.

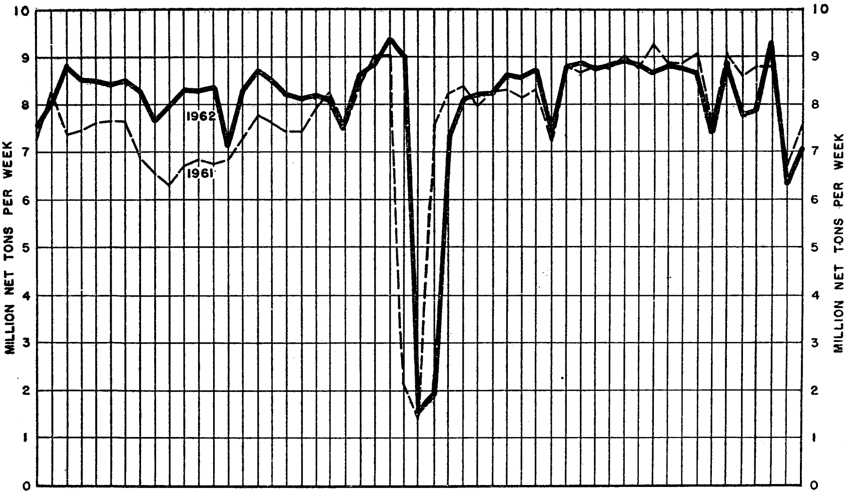


FIGURE 4.—Production of bituminous coal and lignite in the United States, 1961–62, by weeks.

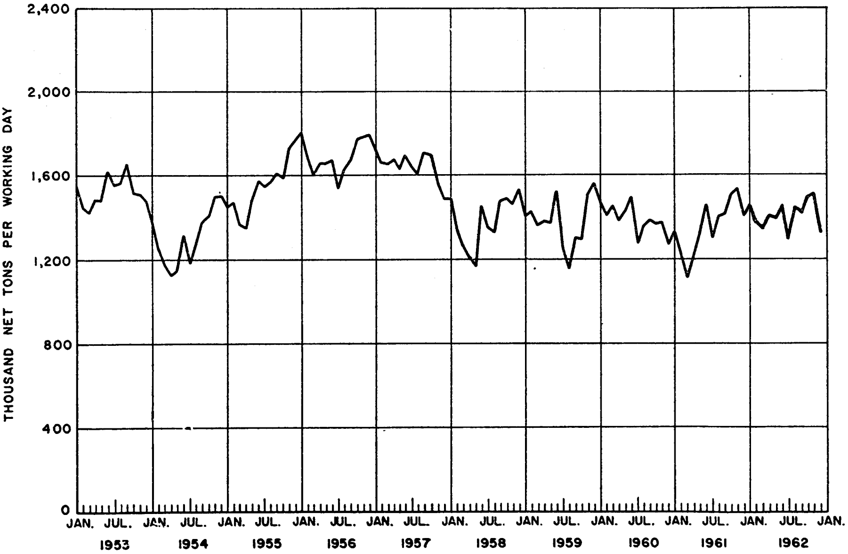


FIGURE 5.—Average production of bituminous coal and lignite in the United States, per working day in each month, 1953–62.

TABLE 6.—Production of bituminous coal and lignite in the United States, with estimates by months

Month	Production (thousand net tons)		Maximum number of working days		Average production per working day (thousand net tons)	
	1961	1962	1961	1962	1961	1962
January	33,250	37,904	25	26	1,330	1,458
February	29,563	33,154	24	24	1,232	1,381
March	30,496	36,325	27.4	27	1,113	1,345
April	29,721	34,215	24.3	24.3	1,223	1,408
May	35,102	36,972	26.6	26.5	1,320	1,395
June	32,105	37,602	22	25.9	1,459	1,452
July	27,075	22,094	20.8	17.1	1,302	1,292
August	37,847	39,005	27	27	1,402	1,445
September	35,409	34,163	25	24	1,416	1,423
October	39,287	40,323	26	27	1,511	1,493
November	38,078	37,288	24.8	24.8	1,535	1,504
December	35,044	33,104	25	25	1,402	1,324
Total	402,977	422,149	297.9	298.6	1,353	1,414

TABLE 7.—Production of bituminous coal and lignite in the United States, 1962, by States, with estimates by months

(Thousand net tons)

[Totals for year are based on final complete returns from producers. Monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources]

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama	1,123	1,075	1,173	1,014	1,223	1,114	659	1,268	1,067	1,100	1,051	1,013	12,880
Alaska	100	92	85	72	58	37	38	61	63	96	85	84	871
Arkansas	20	19	21	19	21	18	17	20	21	29	24	27	256
Colorado	460	329	339	242	243	198	113	199	253	322	333	348	3,379
Georgia	1	1	1	1	1	------	------	------	------	1	1	1	8
Illinois	4,212	3,679	4,089	3,852	4,014	4,325	2,380	4,411	3,777	4,744	4,500	4,504	48,487
Indiana	1,665	1,448	1,491	1,161	1,146	1,289	701	1,265	1,201	1,476	1,362	1,504	15,709
Iowa	144	115	123	66	46	73	69	82	73	90	120	129	1,130
Kansas	106	74	75	46	43	55	37	116	103	99	87	74	915
Kentucky:													
Eastern	3,246	2,753	2,865	2,814	3,380	3,387	2,173	3,819	3,074	3,695	3,390	2,561	37,157
Western	3,022	2,585	2,662	2,502	2,849	2,710	1,787	2,871	2,583	2,970	2,830	2,684	32,055
Total Kentucky	6,268	5,338	5,527	5,316	6,229	6,097	3,960	6,690	5,657	6,665	6,220	5,245	69,212
Maryland	59	56	58	69	78	44	47	79	75	76	98	82	821
Missouri	313	251	233	195	179	213	149	296	207	270	304	286	2,896
Montana:													
Bituminous	10	7	8	6	7	3	5	7	4	7	6	8	78
Lignite	38	27	32	25	28	13	21	25	17	26	24	28	304
Total Montana	48	34	40	31	35	16	26	32	21	33	30	36	382
New Mexico	41	61	67	56	70	71	19	51	57	71	59	54	677
North Dakota (lignite)	364	256	246	180	133	154	144	178	170	300	299	309	2,733
Ohio	2,296	1,932	2,587	3,158	3,180	3,723	2,172	3,227	2,944	3,502	3,048	2,356	34,125
Oklahoma	134	107	120	81	84	81	35	73	87	96	73	77	1,048
Pennsylvania	6,317	5,791	6,073	5,496	5,524	5,584	3,182	5,615	5,187	5,878	5,618	5,050	65,315
South Dakota (lignite)	3	3	3	2	1	------	------	------	------	2	2	2	18
Tennessee	473	487	517	508	585	487	414	594	483	617	583	465	6,213
Utah	565	379	450	277	293	327	109	334	320	450	430	363	4,297
Virginia	2,472	2,270	2,565	2,493	2,722	2,548	1,803	2,840	2,415	2,801	2,443	2,102	29,474
Washington	28	20	22	19	20	18	8	18	14	21	23	24	235
West Virginia	10,373	9,121	10,172	9,696	10,871	11,000	5,896	11,377	9,785	11,310	10,205	8,693	118,499
Wyoming	319	216	248	165	173	130	116	179	183	274	290	276	2,569
Total	**37,904**	**33,154**	**36,325**	**34,215**	**36,972**	**37,602**	**22,094**	**39,005**	**34,163**	**40,323**	**37,288**	**33,104**	**422,149**

TABLE 8.—Production of bituminous coal and lignite in the United States, 1962, by districts, with estimates by months

(Thousand net tons)

[Totals for year are based on final complete returns from producers. Monthly apportionment is based on current records of railroad carloadings and shipments on the Allegheny and Monongahela Rivers, supplemented by direct reports from local sources]

District	January	February	March	April	May	June	July	August	September	October	November	December	Total
1. Eastern Pennsylvania	2,941	2,697	2,827	2,576	2,599	2,594	1,502	2,644	2,443	2,759	2,663	2,386	30,631
2. Western Pennsylvania	3,451	3,164	3,318	3,003	3,018	3,051	1,738	3,068	2,834	3,212	3,069	2,759	35,685
3. Northern West Virginia	3,184	2,856	2,989	2,726	2,988	3,438	2,026	3,538	2,935	3,339	3,185	2,632	35,836
4. Ohio	2,296	1,932	2,587	3,158	3,180	3,723	2,172	3,227	2,944	3,502	3,048	2,356	34,125
5. Michigan	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
6. Panhandle	404	363	380	346	379	437	257	449	373	424	404	334	4,550
7. Southern Numbered 1	2,729	2,386	2,746	2,673	3,018	2,861	1,501	2,987	2,610	3,041	2,664	2,305	31,521
8. Southern Numbered 2	10,124	8,901	9,872	9,637	11,025	10,558	6,397	11,503	9,714	11,462	10,219	8,431	117,843
9. West Kentucky	3,022	2,585	2,662	2,502	2,849	2,710	1,787	2,871	2,583	2,970	2,830	2,684	32,055
10. Illinois	4,212	3,679	4,089	3,852	4,014	4,325	2,380	4,411	3,777	4,744	4,500	4,504	48,487
11. Indiana	1,665	1,448	1,491	1,161	1,146	1,289	701	1,265	1,201	1,476	1,362	1,504	15,709
12. Iowa	144	115	123	66	46	73	69	82	73	90	120	129	1,130
13. Southeastern	1,231	1,187	1,292	1,130	1,357	1,225	753	1,403	1,177	1,241	1,185	1,120	14,301
14. Arkansas-Oklahoma	76	64	71	53	56	52	32	50	57	69	54	59	693
15. Southwestern	497	387	378	288	271	315	206	455	361	425	434	405	4,422
16. Northern Colorado	121	69	69	45	53	35	11	41	51	97	97	100	789
17. Southern Colorado	355	283	295	218	217	190	109	177	224	252	258	269	2,847
18. New Mexico	25	38	42	35	43	44	12	32	35	44	37	33	420
19. Wyoming	319	216	248	165	173	130	116	179	183	274	290	276	2,569
20. Utah	565	379	450	277	293	327	109	334	320	450	430	363	4,297
21. North-South Dakota	367	259	249	182	134	154	144	178	170	302	301	311	2,751
22. Montana	48	34	40	31	35	16	26	32	21	33	30	36	382
23. Washington	128	112	107	91	78	55	46	79	77	117	108	108	1,106
Total	37,904	33,154	36,325	34,215	36,972	37,602	22,094	39,005	34,163	40,323	37,288	33,104	422,149

TABLE 9.—Production of bituminous coal and lignite in the United States, with estimates by weeks

1961				1962			
Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)	Week ended—	Production (thousand net tons)	Maximum number of working days	Average production per working day (thousand net tons)
Jan. 7	7,251	5	1,450	Jan. 6	7,554	5	1,511
Jan. 14	8,286	6	1,381	Jan. 13	8,044	6	1,341
Jan. 21	7,390	6	1,232	Jan. 20	8,854	6	1,476
Jan. 28	7,455	6	1,243	Jan. 27	8,529	6	1,422
Feb. 4	7,622	6	1,270	Feb. 3	8,527	6	1,421
Feb. 11	7,673	6	1,279	Feb. 10	8,439	6	1,407
Feb. 18	7,652	6	1,275	Feb. 17	8,495	6	1,416
Feb. 25	6,908	6	1,151	Feb. 24	8,252	6	1,375
Mar. 4	6,544	6	1,091	Mar. 3	7,684	6	1,281
Mar. 11	6,342	6	1,057	Mar. 10	7,987	6	1,331
Mar. 18	6,721	6	1,120	Mar. 17	8,312	6	1,385
Mar. 25	6,849	6	1,142	Mar. 24	8,333	6	1,389
Apr. 1	6,779	5.7	1,189	Mar. 31	8,373	6	1,396
Apr. 8	6,853	6	1,142	Apr. 7	7,141	5.3	1,347
Apr. 15	7,298	6	1,216	Apr. 14	8,297	6	1,383
Apr. 22	7,769	6	1,295	Apr. 21	8,739	6	1,457
Apr. 29	7,638	6	1,273	Apr. 28	8,540	6	1,423
May 6	7,437	6	1,240	May 5	8,216	6	1,369
May 13	7,469	6	1,245	May 12	8,124	6	1,354
May 20	7,938	6	1,323	May 19	8,204	6	1,367
May 27	8,255	6	1,376	May 26	8,152	6	1,359
June 3	7,551	5.6	1,348	June 2	7,504	5.5	1,364
June 10	8,432	6	1,405	June 9	8,624	6	1,437
June 17	9,032	6	1,505	June 16	8,853	6	1,476
June 24	9,024	5.9	1,529	June 23	9,390	6	1,565
July 1	2,120	1.2	1,767	June 30	9,005	5.9	1,526
July 8	1,439	1.7	846	July 7	1,541	1	1,541
July 15	7,596	6	1,266	July 14	1,951	2.1	929
July 22	8,228	6	1,371	July 21	7,363	6	1,227
July 29	8,375	6	1,396	July 28	8,127	6	1,355
Aug. 5	7,995	6	1,333	Aug. 4	8,207	6	1,368
Aug. 12	8,269	6	1,378	Aug. 11	8,257	6	1,376
Aug. 19	8,303	6	1,384	Aug. 18	8,641	6	1,440
Aug. 26	8,148	6	1,358	Aug. 25	8,587	6	1,431
Sept. 2	8,336	6	1,389	Sept. 1	8,755	6	1,459
Sept. 9	7,239	5	1,448	Sept. 8	7,390	5	1,478
Sept. 16	8,816	6	1,469	Sept. 15	8,803	6	1,467
Sept. 23	8,709	6	1,452	Sept. 22	8,875	6	1,479
Sept. 30	8,827	6	1,471	Sept. 29	8,765	6	1,461
Oct. 7	8,763	6	1,461	Oct. 6	8,831	6	1,472
Oct. 14	9,028	6	1,505	Oct. 13	8,927	6	1,488
Oct. 21	8,789	6	1,465	Oct. 20	8,820	6	1,470
Oct. 28	9,303	6	1,551	Oct. 27	8,689	6	1,448
Nov. 4	8,892	6	1,482	Nov. 3	8,847	6	1,475
Nov. 11	8,875	5.8	1,530	Nov. 10	8,788	6	1,465
Nov. 18	9,073	6	1,512	Nov. 17	8,683	5.8	1,497
Nov. 25	7,622	5	1,524	Nov. 24	7,396	5	1,479
Dec. 2	9,056	6	1,509	Dec. 1	8,939	6	1,490
Dec. 9	8,614	6	1,436	Dec. 8	7,802	6	1,300
Dec. 16	8,838	6	1,473	Dec. 15	7,872	6	1,312
Dec. 23	8,826	6	1,471	Dec. 22	9,337	6	1,556
Dec. 30	6,730	5	1,346	Dec. 29	6,316	5	1,263
				Jan. 5	[1] 1,468	1	[2] 1,420
Total	402,977	297.9	1,353	Total	422,149	298.6	1,414

[1] Figures represent output and number of working days in that part of week included in calendar year shown. Total production for the week ended Jnauary 5, 1963, was 7,100,000 net tons.

[2] Average daily output for the entire week and not for working days in the calendar year shown.

SUMMARY BY STATES

TABLE 10.—Bituminous coal and lignite produced in the United States, by States, with production of maximum year and cumulative production from earliest record to end of 1962

[Thousand net tons]

State	Maximum production		Production, by years										Total production from earliest record to end of 1962
	Year	Quantity	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	
Alabama	1926	21,001	12,532	10,282	13,088	12,663	13,260	11,182	11,947	13,011	12,915	12,880	985,440
Arkansas	1907	2,670	775	477	578	590	508	364	441	409	395	256	99,318
Colorado	1917	12,483	3,575	2,900	3,568	3,502	3,594	2,974	3,294	3,607	3,678	3,379	517,177
Illinois	1918	89,291	46,010	41,971	45,932	48,102	46,993	43,912	45,466	45,977	45,246	48,487	3,745,660
Indiana	1918	30,679	15,812	13,400	16,149	17,089	15,841	15,022	14,804	15,538	15,106	15,709	1,195,516
Iowa	1917	8,966	1,388	1,197	1,258	1,358	1,312	1,179	1,180	1,068	927	1,130	354,632
Kansas	1918	7,562	1,715	1,372	742	884	749	823	772	888	664	915	281,690
Kentucky	1947	84,241	65,060	56,964	69,020	74,555	74,667	66,312	62,810	66,847	63,032	69,212	2,843,834
Maryland	1907	5,533	530	422	512	669	748	838	842	748	757	821	268,537
Missouri	1917	5,671	2,393	2,514	3,232	3,283	2,976	2,592	2,748	2,890	2,938	2,896	295,117
Montana	1944	4,844	1,873	1,491	1,247	846	413	305	345	313	371	382	171,784
New Mexico	1918	4,023	514	123	201	158	137	117	148	295	412	677	126,492
North Dakota	1950	3,261	2,803	(1)	3,102	2,815	2,561	2,314	2,413	2,525	2,726	2,733	[2] 101,101
Ohio	1920	45,878	34,737	32,469	37,870	38,934	36,862	32,028	35,112	33,957	32,226	34,125	2,157,921
Oklahoma	1920	4,849	2,168	1,915	2,164	2,007	2,195	1,630	1,525	1,342	1,031	1,048	182,895
Pennsylvania	1918	178,551	93,331	72,010	85,713	90,287	85,365	67,771	65,347	65,425	62,652	65,315	8,422,222
Tennessee	1956	8,848	5,467	6,429	7,053	8,848	7,955	6,785	5,913	5,931	5,860	6,213	406,502
Utah	1947	7,429	6,544	5,008	6,296	6,522	6,858	5,328	4,545	4,955	5,159	4,297	272,324
Virginia	1961	30,332	19,119	16,387	23,508	28,063	29,506	26,826	29,769	27,838	30,332	29,474	875,591
Washington	1918	4,082	690	619	610	473	360	252	242	228	191	235	148.924
West Virginia	1947	176,157	134,105	115,996	139,168	155,891	156,842	119,468	119,692	118,944	113,071	118,499	6,702,558
Wyoming	1945	9,847	5,245	2,831	2,927	2,553	2,117	1,629	1,977	2,024	2,529	2,569	408,728
Other States [3]	--------	----------	904	4,929	695	782	885	795	696	752	759	897	187,178
Total	1947	630,624	457,290	391,706	464,633	500,874	492,704	410,446	412,028	415,512	402,977	422,149	30,751,141

---

[1] North Dakota included in "Other States" in 1954 to avoid disclosing individual operations.

[2] Excludes production of North Dakota in 1954 to avoid discloisng individual operations.

[3] Production, if any, in Alaska, Arizona, California, Georgia, Idaho, Michigan, North Carolina, Oregon, South Dakota, or Texas included in "Other States."

TABLE 11.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States

State	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
Alabama	186	11,172,120	835,721	871,819	12,879,660	$7.39	5,961	200	1,191,303	10.81
Alaska	6	850,751	3,216	17,412	871,379	7.35	156	302	47,051	18.52
Arkansas	16	241,224	14,515	------------	255,739	7.07	225	135	30,309	8.44
Colorado	93	2,285,229	982,959	111,212	3,379,400	5.92	1,697	183	310,344	10.89
Georgia	1	------------	7,830	------------	7,830	3.53	21	213	4,474	1.75
Illinois	109	42,861,231	5,484,735	141,396	48,487,362	3.86	8,492	232	1,966,524	24.66
Indiana	69	13,028,567	1,914,923	765,412	15,708,902	3.82	2,977	227	675,657	23.25
Iowa	35	763,382	365,055	1,127	1,129,564	3.56	565	154	86,978	12.99
Kansas	11	725,329	185,349	4,321	914,999	4.64	233	227	52,882	17.30
Kentucky	1,934	61,860,499	7,290,585	60,935	69,212,019	3.91	23,076	186	4,292,710	16.12
Maryland	64	410,444	410,162	15	820,621	3.86	474	173	82,088	10.00
Missouri	28	1,813,074	423,820	659,073	2,895,967	4.16	643	227	145,723	19.87
Montana:										
Bituminous	14	26,274	51,183	206	77,663	6.90	87	144	12,521	6.20
Lignite	5	295,360	9,136	------------	304,496	1.99	31	176	5,452	55.85
Total Montana	19	321,634	60,319	206	382,159	2.98	118	152	17,973	21.26
New Mexico	14	650,033	26,856	268	677,157	3.83	325	125	40,744	16.62
North Dakota (lignite)	33	1,927,937	442,282	362,635	2,732,854	2.24	315	206	64,987	42.05
Ohio	451	17,576,682	12,088,023	4,459,958	34,124,663	3.72	8,099	223	1,808,780	18.87
Oklahoma	18	972,200	75,617	231	1,048,048	6.66	517	193	99,774	10.50
Pennsylvania	1,177	50,874,376	12,906,489	1,534,521	65,315,386	5.07	26,209	200	5,245,073	12.45
South Dakota (lignite)	1	------------	17,914	------------	17,914	4.30	8	189	1,513	11.84
Tennessee	353	4,455,231	1,755,398	2,982	6,213,611	3.63	4,180	145	604,867	10.27
Utah	38	3,816,983	452,503	27,534	4,297,020	5.40	2,034	169	344,508	12.47
Virginia	1,351	25,125,708	4,066,363	282,252	29,474,323	3.99	13,007	208	2,703,780	10.90
Washington	9	173,656	57,217	4,084	234,957	6.94	199	218	43,481	5.40
West Virginia	1,706	111,854,467	4,172,184	2,472,416	118,499,067	4.88	43,763	200	8,733,310	13.57
Wyoming	18	1,673,269	813,074	82,381	2,568,724	3.20	528	158	83,430	30.79
Total	7,740	355,434,026	54,853,109	11,862,190	422,149,325	4.48	143,822	199	28,678,263	14.72

[1] Includes coal loaded at mine directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal used at mine for power and heat, made into beehive coke at mine, used by mine employees, all other uses at mine, taken by locomotive tender, and transported from mine to point of use by conveyor, tram, or pipeline.

[3] Value received or charged for coal, f.o.b. mine. Includes a value, estimated by producer, for coal not sold.

TABLE 12.—Number of mines, production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by districts

District	Number of active mines	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
		Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
1. Eastern Pennsylvania	882	24,090,596	5,832,572	707,486	30,630,654	$4.39	12,935	196	2,530,421	12.10
2. Western Pennsylvania	376	27,284,967	7,573,255	827,066	35,685,288	5.63	13,862	203	2,819,023	12.66
3. Northern West Virginia	530	34,527,902	1,264,801	43,554	35,836,257	4.66	12,039	200	2,405,248	14.90
4. Ohio	451	17,576,682	12,088,023	4,459,958	34,124,663	3.72	8,099	223	1,808,780	18.87
5. Michigan	----	----	----	----	----	----	----	----	----	----
6. Panhandle	19	2,155,275	275,210	2,119,655	4,550,140	4.31	1,204	222	266,907	17.05
7. Southern Numbered 1	806	29,708,896	1,659,216	153,120	31,521,232	5.82	14,593	192	2,799,784	11.26
8. Southern Numbered 2	3,747	105,033,387	12,311,333	498,432	117,843,152	4.28	49,904	191	9,549,533	12.34
9. West Kentucky	94	30,653,460	1,397,780	3,637	32,054,877	3.38	4,720	239	1,127,997	28.42
10. Illinois	109	42,861,231	5,484,735	141,396	48,487,362	3.86	8,492	232	1,966,524	24.66
11. Indiana	69	13,028,567	1,914,923	765,412	15,708,902	3.82	2,977	227	675,657	23.25
12. Iowa	35	763,382	365,055	1,127	1,129,564	3.56	565	154	86,978	12.99
13. Southeastern	318	12,298,362	1,130,565	871,990	14,300,917	7.05	7,434	183	1,358,692	10.53
14. Arkansas-Oklahoma	25	673,702	19,239	10	692,951	7.53	435	144	62,609	11.07
15. Southwestern	48	3,078,125	680,062	663,615	4,421,802	4.49	1,183	225	266,079	16.62
16. Northern Colorado	7	478,140	303,166	7,437	788,743	4.17	249	204	50,694	15.56
17. Southern Colorado	90	2,058,491	684,771	104,043	2,847,305	6.33	1,687	169	285,187	9.98
18. New Mexico	10	398,631	21,878	----	420,509	3.05	86	177	15,207	27.65
19. Wyoming	18	1,673,269	813,074	82,381	2,568,724	3.20	528	158	83,430	30.79
20. Utah	38	3,816,983	452,503	27,534	4,297,020	5.40	2,034	169	344,508	12.47
21. North-South Dakota	34	1,927,937	460,196	362,635	2,750,768	2.26	323	206	66,500	41.36
22. Montana	19	321,634	60,319	206	382,159	2.98	118	152	17,973	21.26
23. Washington	15	1,024,407	60,433	21,496	1,106,336	7.27	355	255	90,532	12.22
Total	7,740	355,434,026	54,853,109	11,862,190	422,149,325	4.48	143,822	199	28,678,263	14.72

[1] Includes coal loaded at mine directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal used at mine for power and heat, made into beehive coke at mine, used by mine employees, all other uses at mine, taken by locomotive tender, and transported from mine to point of use by conveyor, tram, or pipeline.

[3] Value received or charged for coal, f.o.b. mine. Includes a value, estimated by producer, for coal not sold.

NUMBER AND SIZE OF MINES

The unit in the statistical record is the mine, and operating companies are requested to make a separate report for each mine because its location is definitely known and can be related to a specific district or county; its identity can be followed through successive changes of ownership; and it is the natural operating unit from the standpoint of cost, mechanical equipment, mining practice, and output per man per day. See figure 6.

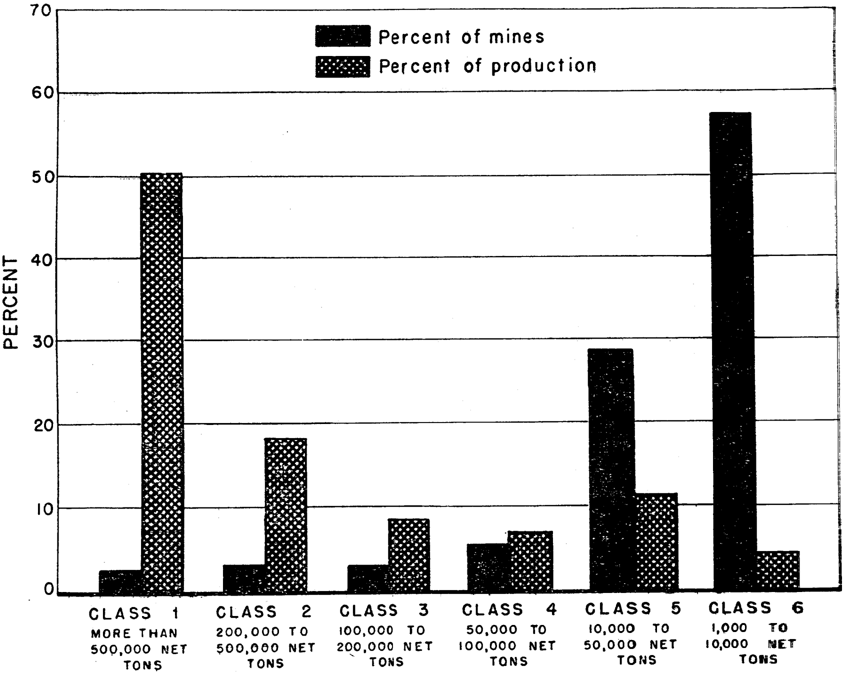


FIGURE 6.—Percentage of number of mines and of production of bituminous coal and lignite mines in the United States, 1962, by size of output.

TABLE 13.—Number and production of bituminous coal and lignite mines in the United States, 1962, by States and size of output

State	Class 1—500,000 tons and over				Class 2—200,000 to 500,000 tons				Class 3—100,000 to 200,000 tons			
	Mines		Production		Mines		Production		Mines		Production	
	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage	Number	Percentage	Net tons	Percentage
Alabama	6	3.2	6,514,488	50.6	9	4.9	2,834,914	22.0	14	7.5	1,858,075	14.4
Alaska	---	---	---	---	1	16.7	448,304	51.4	3	50.0	416,065	47.8
Arkansas	---	---	---	---	---	---	---	---	---	---	---	---
Colorado	1	1.1	655,314	19.4	3	3.2	930,521	27.5	4	4.3	519,412	15.4
Georgia	---	---	---	---	---	---	---	---	---	---	---	---
Illinois	34	31.2	42,188,615	87.0	12	11.0	4,136,057	8.5	6	5.5	883,724	1.8
Indiana	15	21.7	13,448,781	85.6	3	4.4	1,219,128	7.8	---	---	---	---
Iowa	---	---	---	---	1	2.9	216,817	19.2	2	5.7	274,743	24.3
Kansas	1	9.1	603,063	65.9	---	---	---	---	2	18.2	264,666	28.9
Kentucky	27	1.4	33,870,217	48.9	27	1.4	8,730,376	12.6	45	2.3	6,276,324	9.1
Maryland	---	---	---	---	---	---	---	---	1	1.6	135,201	16.5
Missouri	1	3.6	656,906	22.7	4	14.3	1,623,594	56.1	3	10.7	339,896	11.7
Montana (bituminous and lignite)	---	---	---	---	1	5.3	295,360	77.3	---	---	---	---
New Mexico	---	---	---	---	2	14.3	604,969	89.3	---	---	---	---
North Dakota (lignite)	2	6.1	1,209,545	44.3	2	6.0	617,503	22.6	3	9.1	529,617	19.4
Ohio	17	3.8	17,192,334	50.4	17	3.8	4,604,909	13.5	30	6.7	4,254,398	12.5
Oklahoma	---	---	---	---	2	11.1	465,382	44.4	2	11.1	229,721	21.9
Pennsylvania	30	2.6	27,705,105	42.4	45	3.8	13,840,581	21.2	52	4.4	7,483,374	11.5
South Dakota (lignite)	---	---	---	---	---	---	---	---	---	---	---	---
Tennessee	1	.3	507,152	8.2	1	.3	485,318	7.8	12	3.4	1,593,028	25.6
Utah	2	5.3	1,083,919	25.2	4	10.5	1,419,949	33.0	7	18.4	991,526	23.1
Virginia	3	.2	7,292,079	24.7	13	1.0	3,915,968	13.3	8	.6	1,050,212	3.6
Washington	---	---	---	---	---	---	---	---	1	11.1	168,392	71.7
West Virginia	63	3.7	60,084,871	50.7	89	5.2	28,644,368	24.2	60	3.5	8,609,667	7.3
Wyoming	1	5.6	759,628	29.6	4	22.2	1,423,567	55.4	---	---	---	---
Total	204	2.6	213,772,017	50.6	240	3.1	76,457,585	18.1	255	3.3	35,878,041	8.5

TABLE 13.—Number and production of bituminous coal and lignite mines in the United States, 1962, by States and size of output—Con.

State	Class 4—50,000 to 100,000 tons				Class 5—10,000 to 50,000 tons				Class 6—less than 10,000 tons				Total		
	Mines		Production		Mines		Production		Mines		Production		Mines	Production (net tons)	
	Number	Percentage	Net tons	Percentage	Number	Percentber	Net tons	Percentage	Number	Percentage	Net tons	Percentage		Total	Average per mine
Alabama	6	3.2	427,398	3.3	35	18.8	719,503	5.6	116	62.4	525,282	4.1	186	12,879,660	69,245
Alaska	------	------	------	------	------	------	------	------	2	33.3	7,010	.8	6	871,379	145,230
Arkansas	1	6.2	87,180	34.1	7	43.8	151,734	59.3	8	50.0	16,825	6.6	16	255,739	15,984
Colorado	7	7.5	560,095	16.6	20	21.5	507,444	15.0	58	62.4	206,614	6.1	93	3,379,400	36,338
Georgia	------	------	------	------	------	------	------	------	1	100.0	7,830	100.0	1	7,830	7,830
Illinois	9	8.2	684,324	1.4	21	19.3	481,849	1.0	27	24.8	112,793	.3	109	48,487,362	444,838
Indiana	7	10.2	545,866	3.5	13	18.8	354,658	2.2	31	44.9	140,469	.9	69	15,708,902	227,665
Iowa	3	8.6	215,682	19.1	13	37.1	354,307	31.4	16	45.7	68,015	6.0	35	1,129,564	32,273
Kansas	------	------	------	------	1	9.1	27,602	3.0	7	63.6	19,668	2.2	11	914,999	83,182
Kentucky	69	3.6	4,791,502	6.9	508	26,3	10,377,951	15.0	1,258	65.0	5,165,649	7.5	1,934	69,212,019	35,787
Maryland	4	6.2	253,094	30.8	14	21.9	272,394	33.2	45	70.3	159,932	19.5	64	820,621	12,822
Missouri	2	7.1	135,064	4.7	4	14.3	92,968	3.2	14	50.0	47,539	1.6	28	2,895,967	103,427
Montana (bituminous and lignite)	------	------	------	------	1	5.2	23,731	6.2	17	89.5	63,068	16.5	19	382,159	20,114
New Mexico	------	------	------	------	1	7.1	41,766	6.2	11	78.6	30,422	4.5	14	677,157	52,089
North Dakota (lignite)	1	3.0	80,413	2.9	9	27.3	228,588	8.4	16	48.5	67,188	2.4	33	2,732,854	82,814
Ohio	50	11.1	3,592,914	10.5	144	31.8	3,661,979	10.7	193	42.8	818,129	2.4	451	34,124,663	75,664
Oklahoma	3	16.7	218,528	20.9	5	27.8	113,430	10.8	6	33.3	20,987	2.0	18	1,048,048	58,225
Pennsylvania	94	8.0	6,636,358	10.2	318	27.0	7,344,233	11.2	638	54.2	2,305,735	3.5	1,177	65,315,386	55,493
South Dakota (lignite)	------	------	------	------	1	100.0	17,914	100.0	------	------	------	------	1	17,914	17,914
Tennessee	13	3.7	898,126	14.5	84	23.8	1,786,735	28.7	242	68.5	943,252	15.2	353	6,213,611	17,602
Utah	5	13.2	450,899	10.5	12	31.6	330,456	7.7	8	21.0	20,271	.5	38	4,297,020	113,079
Virginia	52	3.8	3,183,298	10.8	483	35.8	10,374,106	35.2	792	58.6	3,658,660	12.4	1,351	29,474,323	21,817
Washington	------	------	------	------	3	33.3	45,927	19.5	5	55.6	20,638	8.8	9	234,957	26,106
West Virginia	83	4.9	5,737,798	4.8	502	29.4	11,121,070	9.4	909	53.3	4,301,293	3.6	1,706	118,499,067	69,467
Wyoming	5	27.8	332,627	12.9	2	11.1	32,621	1.3	6	33.3	20,281	.8	18	2,568,724	142,700
Total	414	5.4	28,831,166	6.8	2,201	28.4	48,462,966	11.5	4,426	57.2	18,747,550	4.5	7,740	422,149,325	54,541

EMPLOYMENT AND PRODUCTIVITY

The bituminous coal and lignite industry has become highly mechanized in recent years. Mechanization has strongly affected production per man per day and the number of employees. In the past 20 years productivity has increased 188 percent and the number of employees has declined 69 percent. See figure 7.

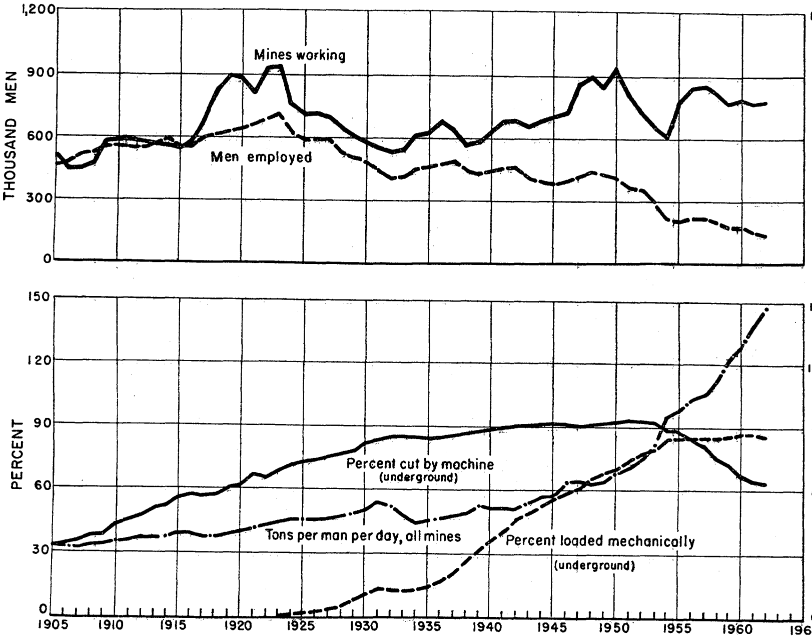


FIGURE 7.—Trends of employment, mechanization, and output per man at bituminous coal and lignite mines in the United States, 1905–62.

TABLE 14.—Production and average output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and by underground, strip, and auger mining

State	Production (net tons)				Percentage of total production				Average tons per man per day			
	Underground	Strip	Auger	Total	Underground	Strip	Auger	Total	Underground	Strip	Auger	Total
Alabama	9,990,078	2,773,953	115,629	12,879,660	77.6	21.5	0.9	100.0	9.42	21.71	34.59	10.81
Alaska	109,813	761,566	------	871,379	12.6	87.4	------	100.0	19.55	18.38	------	18.52
Arkansas	89,612	166,127	------	255,739	35.0	65.0	------	100.0	5.03	13.31	------	8.44
Colorado	2,818,817	560,583	------	3,379,400	83.4	16.6	------	100.0	9.76	25.90	------	10.89
Georgia	7,830	------	------	7,830	100.0	------	------	100.0	1.75	------	------	1.75
Illinois	23,902,311	24,585,051	------	48,487,362	49.3	50.7	------	100.0	20.41	30.90	------	24.66
Indiana	4,399,971	11,308,931	------	15,708,902	28.0	72.0	------	100.0	12.18	35.97	------	23.25
Iowa	163,682	965,882	------	1,129,564	14.5	85.5	------	100.0	4.52	19.03	------	12.99
Kansas	2,189	912,810	------	914,999	.2	99.8	------	100.0	1.82	17.66	------	17.30
Kentucky	42,868,091	22,438,327	3,905,601	69,212,019	61.9	32.4	5.7	100.0	11.73	44.15	30.11	16.12
Maryland	352,016	468,605	------	820,621	42.9	57.1	------	100.0	6.44	17.08	------	10.00
Missouri	56,419	2,839,548	------	2,895,967	1.9	98.1	------	100.0	3.00	22.37	------	19.87
Montana:												
Bituminous	74,663	3,000	------	77,663	96.1	3.9	------	100.0	6.12	9.43	------	6.20
Lignite	8,030	296,466	------	304,496	2.6	97.4	------	100.0	6.13	71.59	------	55.85
Total Montana	82,693	299,466	------	382,159	21.6	78.4	------	100.0	6.12	67.16	------	21.26
New Mexico	279,242	397,915	------	677,157	41.2	58.8	------	100.0	8.57	48.80	------	16.62
North Dakota (lignite)	2,059	2,730,795	------	2,732,854	.1	99.9	------	100.0	9.85	42.16	------	42.05
Ohio	9,333,998	23,441,780	1,348,885	34,124,663	27.3	68.7	4.0	100.0	11.67	24.03	40.24	18.87
Oklahoma	158,905	889,143	------	1,048,048	15.2	84.8	------	100.0	3.20	17.74	------	10.50
Pennsylvania	42,480,713	22,207,175	627,498	65,315,386	65.0	34.0	1.0	100.0	10.70	17.74	27.97	12.45
South Dakota (lignite)	------	17,914	------	17,914	------	100.0	------	100.0	------	11.84	------	11.84
Tennessee	3,720,718	2,275,233	217,660	6,213,611	59.9	36.6	3.5	100.0	7.16	29.19	31.26	10.27
Utah	4,297,020	------	------	4,297,020	100.0	------	------	100.0	12.47	------	------	12.47
Virginia	26,728,210	1,792,473	953,640	29,474,323	90.7	6.1	3.2	100.0	10.19	33.32	34.83	10.90
Washington	232,842	2,115	------	234,957	99.1	.9	------	100.0	5.38	12.66	------	5.40
West Virginia	108,960,248	6,124,999	3,413,820	118,499,067	91.9	5.2	2.9	100.0	12.97	24.76	41.42	13.57
Wyoming	228,891	2,339,833	------	2,568,724	8.9	91.1	------	100.0	7.94	42.84	------	30.79
Total	281,266,368	130,300,224	10,582,733	422,149,325	66.6	30.9	2.5	100.0	11.97	26.76	34.61	14.72

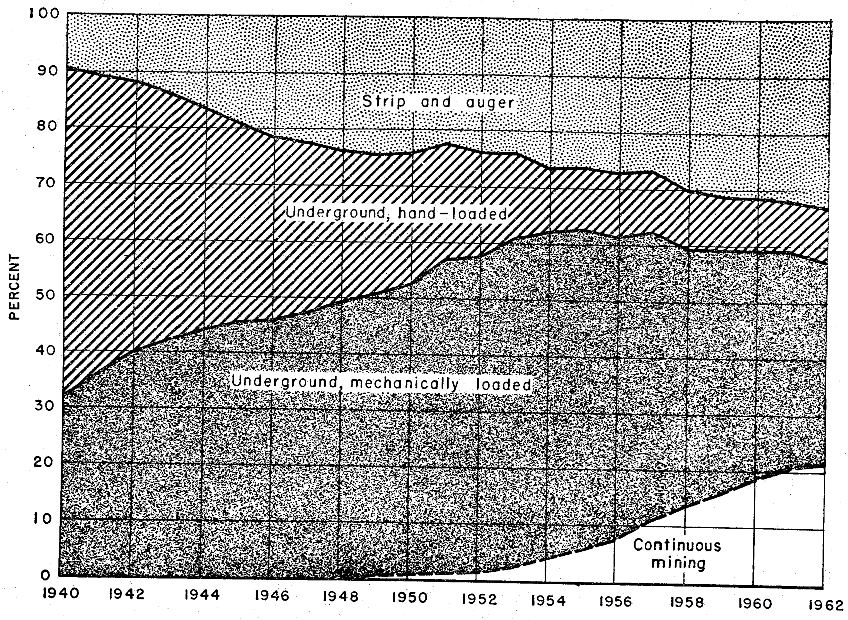


FIGURE 8.—Percentage of total production of bituminous coal and lignite in the United States, 1940–62, by type of mining and loading.

UNDERGROUND MINING

Two-thirds of the output of bituminous coal and lignite is mined underground. The major tasks underground are cutting, drilling shotholes, loading, and haulage. Loading is discussed later in the section on Mechanical Loading. For many years most of the underground production has been cut by machine; however, as the percentage of production by continuous-mining machines increases, the percentage cut by machines will decrease. The use of power drills for shotholes increased rapidly from less than 50 percent of the underground production in 1940 to a maximum of 84 percent in 1953. The use of continuous-mining machines decreased the tonnage power-drilled for shotholes to 67 percent of the underground output. Trolley locomotives are the principal method of underground haulage; however, in recent years the use of conveyor haulage has increased steadily.

Mines producing 61 percent of the underground output reported 114,103 rail mine cars and 2,755 miles of rail track, while mines producing 4 percent used rubber-tired mine cars. Mines not reporting type of haulage produced 12 percent, and mines employing 100-percent conveyor haulage furnished the remaining 23 percent of the underground production. The largest number of mine cars—27 percent—were 4- to 5-ton capacity. However, 11 percent of all rail mine cars were large, 10 tons and over, and hauled the largest amount—28 percent—of the tonnage handled by rail mine cars. In contrast, the most frequent size of rubber-tired mine cars was
]

2-ton capacity; cars of this size hauled 57 percent of the tonnage handled by rubber-tired mine cars.

A recent development in underground haulage is the introduction of a medium-sized rubber-tired mine car, that is used in conjunction with a rubber-tired tractor, to transport the coal from the loading machine to the main haulageway. Practically all of the rubber-tired haulage equipment, exclusive of shuttle cars, is located in small mines in Virginia, eastern Kentucky, and southern West Virginia. Another innovation, particularly for small mines, has been the introduction of the shuttle buggy. This is a self-powered rubber-tired mine car which is hand loaded. The largest number of these shuttle buggies is used in eastern Kentucky and West Virginia.

TABLE 15.—Number of mines, production, men working daily, days active, man-days, and output per man per day at underground bituminous coal and lignite mines in the United States, 1962, by States

State	Number of active mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Alabama	140	9,990,078	5,246	202	1,060,166	9.42
Alaska	1	109,813	20	281	5,617	19.55
Arkansas	9	89,612	129	138	17,829	5.03
Colorado	85	2,818,817	1,585	182	288,699	9.76
Georgia	1	7,830	21	213	4,474	1.75
Illinois	46	23,902,311	5,461	214	1,170,905	20.41
Indiana	31	4,399,971	1,731	209	361,276	12.18
Iowa	13	163,682	335	108	36,209	4.52
Kansas	1	2,189	8	150	1,203	1.82
Kentucky	1,729	42,868,091	19,726	185	3,654,782	11.73
Maryland	35	352,016	316	173	54,652	6.44
Missouri	9	56,419	135	139	18,789	3.00
Montana:						
Bituminous	13	74,663	83	147	12,203	6.12
Lignite	3	8,030	10	131	1,311	6.13
Total Montana	16	82,693	93	145	13,514	6.12
New Mexico	12	279,242	290	112	32,590	8.57
North Dakota (lignite)	1	2,059	3	69	209	9.85
Ohio	132	9,333,998	3,861	207	799,626	11.67
Oklahoma	6	158,905	262	190	49,654	3.20
Pennsylvania	595	42,480,713	20,380	195	3,970,987	10.70
Tennessee	289	3,720,718	3,675	141	519,957	7.16
Utah	38	4,297,020	2,034	169	344,508	12.47
Virginia	1,274	26,728,210	12,588	208	2,622,601	10.19
Washington	8	232,842	195	222	43,314	5.38
West Virginia	1,467	108,960,248	41,676	202	8,403,523	12.97
Wyoming	8	228,891	314	92	28,813	7.94
Total	5,946	281,266,368	120,084	196	23,503,897	11.97

TABLE 16.—Underground production of bituminous coal and lignite in the United States, 1962, by States and mining methods

State	Cut by hand and shot from solid		Cut by machines				Mined by continuous-mining machines		Total underground (net tons)
	Net tons	Percentage of total underground	Net tons	Percentage of total underground	Number of coal-cutting machines	Average output per machine (net tons)	Net tons	Percentage of total underground	
Alabama	226,596	2.3	9,489,829	95.0	178	53,314	273,653	2.7	9,990,078
Alaska	109,813	100.0							109,813
Arkansas			89,612	100.0	13	6,893			89,612
Colorado	177,394	6.3	1,301,001	46.1	157	8,287	1,340,422	47.6	2,818,817
Georgia			7,830	100.0	1	7,830			7,830
Illinois			15,706,760	65.7	94	167,093	8,195,551	34.3	23,902,311
Indiana	5,014	.1	3,545,835	80.6	67	52,923	849,122	19.3	4,399,971
Iowa	18,667	11.4	145,015	88.6	14	10,358			163,682
Kansas			2,189	100.0	1	2,189			2,189
Kentucky	3,405,968	8.0	36,012,725	84.0	1,233	29,207	3,449,398	8.0	42,868,091
Maryland	77,378	22.0	212,194	60.3	35	6,063	62,444	17.7	352,016
Missouri			56,419	100.0	13	4,340			56,419
Montana:									
Bituminous			74,663	100.0	22	3,394			74,663
Lignite	6,712	83.6	1,318	16.4	2	659			8,030
Total Montana	6,712	8.1	75,981	91.9	24	3,166			82,693
New Mexico	16,044	5.8	11,528	4.1	8	1,441	251,670	90.1	279,242
North Dakota (lignite)	2,059	100.0							2,059
Ohio	26,197	.3	5,731,549	61.4	197	29,094	3,576,252	38.3	9,333,998
Oklahoma	2,660	1.7	83,831	52.7	43	1,950	72,414	45.6	158,905
Pennsylvania	561,052	1.3	12,038,366	28.3	748	16,094	29,881,295	70.4	42,480,713
Tennessee	499,723	13.4	2,938,543	79.0	165	17,809	282,452	7.6	3,720,718
Utah			2,517,500	58.6	86	29,273	1,779,520	41.4	4,297,020
Virginia	4,775,245	17.9	20,229,718	75.7	859	23,550	1,723,247	6.4	26,728,210
Washington	128,254	55.1	540	.2	1	540	104,048	44.7	232,842
West Virginia	3,089,960	2.8	67,554,628	62.0	1,595	42,354	38,315,660	35.2	108,960,248
Wyoming			211,710	92.5	29	7,300	17,181	7.5	228,891
Total	13,128,736	4.7	177,963,303	63.3	5,561	32,002	90,174,329	32.0	281,266,368

TABLE 17.—Summary of drilling operations at underground bituminous coal and lignite mines in the United States

Year	Number of mines using power drills	Number of power drills[1]					Production (thousand net tons)—				Production, percent—		
		Electric	Face or coal	Compressed air	Roof or rock	Total	Where shotholes are power-drilled	Where shotholes are hand-drilled	Where no shotholes are required (continuous mining)	Total	Where shotholes are power-drilled	Where shotholes are hand-drilled	Where no shotholes are required (continuous mining)
1936	599	3,968	----------	1,302	----------	5,270	111,950	299,012	----------	410,962	27.2	72.8	----------
1937	(2)	(2)	----------	(2)	----------	(2)	(2)	(2)	----------	413,780	(2)	(2)	----------
1938	1,061	5,071	----------	1,465	----------	6,536	122,581	195,557	----------	318,138	38.5	61.5	----------
1939	(2)	(2)	----------	(2)	----------	(2)	(2)	(2)	----------	357,133	(2)	(2)	----------
1940	1,172	6,613	----------	1,378	----------	7,991	197,083	220,521	----------	417,604	47.2	52.8	----------
1941	1,266	7,697	----------	1,502	----------	9,199	237,213	221,865	----------	459,078	51.7	48.3	----------
1942	1,364	8,482	----------	1,564	----------	10,046	281,530	233,960	----------	515,490	54.6	45.4	----------
1943	1,376	8,930	----------	1,630	----------	10,560	299,805	210,687	----------	510,492	58.7	41.3	----------
1944	1,501	9,755	----------	1,903	----------	11,658	324,116	194,562	----------	518,678	62.5	37.5	----------
1945	1,504	10,267	----------	1,855	----------	12,122	302,786	164,844	----------	467,630	64.7	35.3	----------
1946	1,702	10,968	----------	1,884	----------	12,852	278,734	142,224	----------	420,958	66.2	33.8	----------
1947	2,522	12,940	----------	1,449	----------	14,389	351,866	139,363	----------	491,229	71.6	28.4	----------
1948	2,798	13,970	----------	1,312	----------	15,282	336,873	122,689	450	460,012	73.2	26.7	0.1
1949	2,923	14,087	----------	1,411	----------	15,498	251,329	77,894	2,600	331,823	75.7	23.5	.8
1950	3,112	14,277	----------	1,282	----------	15,559	286,661	101,333	4,850	392,844	73.0	25.8	1.2
1951	3,027	14,231	----------	1,345	----------	15,576	324,645	85,136	6,061	415,842	78.0	20.5	1.5
1952	2,830	13,468	----------	1,292	----------	14,760	284,048	64,162	8,215	356,425	79.7	18.0	2.3
1953	2,486	12,054	----------	1,053	----------	13,107	293,161	44,560	11,830	349,551	83.9	12.7	3.4
1954	2,137	10,782	----------	885	----------	11,667	233,557	39,219	16,336	289,112	80.7	13.6	5.7
1955	2,003	9,533	----------	476	----------	10,009	285,348	30,657	27,460	343,465	83.1	8.9	8.0
1956	4,033	(1)	11,021	(1)	2,443	13,464	306,675	19,192	39,907	365,774	83.8	5.3	10.9
1957	4,152	(1)	10,938	(1)	2,981	13,919	294,186	12,680	53,783	360,649	81.6	3.5	14.9
1958	4,410	(1)	9,691	(1)	2,947	12,638	216,226	14,285	56,373	286,884	75.4	5.0	19.6
1959	3,979	(1)	8,524	(1)	2,814	11,338	207,043	10,599	65,792	283,434	73.1	3.7	23.2
1960	4,294	(1)	8,265	(1)	2,840	11,105	194,956	12,004	77,928	284,888	68.4	4.2	27.4
1961	4,333	(1)	7,837	(1)	3,153	10,990	181,741	6,704	84,321	272,766	66.6	2.5	30.9
1962	4,660	(1)	7,744	(1)	3,121	10,865	187,324	3,768	90,174	281,266	66.6	1.4	32.0

---

[1] Total number of power drills before 1956 are not strictly comparable with the figures for 1956 to data. Data were collected by "type" of drills before 1956 and by "use" of drills 1956 to date. Most of the "electric" drills were used in coal and most of the "compressed air" drills were used in rock. "Face or coal" drills include hand-held, post-mounted, and mobile drills. "Roof or rock" drills include rotary and percussion drills.

[2] Data not available.

TABLE 18.—Use of power drills in underground bituminous coal and lignite mines in the United States, 1962, by States

State	Number of mines using power drills	Number of power drills						Production where shotholes are power-drilled (net tons)			
		Face or coal drills		Roof or rock drills				Handheld and post-mounted drills	Mobile drills	Total	Percentage of total underground
		Handheld and post-mounted	Mobile	Roof bolting		Other uses					
				Rotary	Percussion	Rotary	Percussion				
Alabama	93	238	7	45	100	4	20	8,988,200	632,720	9,620,920	96.3
Alaska	1	14	-	-	-	-	-	109,813	-	109,813	100.0
Arkansas	4	8	-	-	-	3	-	70,206	-	70,206	78.3
Colorado	74	214	7	5	31	-	2	1,689,258	170,816	1,860,074	66.0
Georgia	1	1	-	-	-	-	-	7,830	-	7,830	100.0
Illinois	46	30	104	108	-	4	3	418,010	15,288,750	15,706,760	65.7
Indiana	31	38	29	43	-	1	2	417,079	3,133,770	3,550,849	80.7
Iowa	8	9	2	2	-	1	-	44,155	96,541	140,696	86.0
Kentucky	1,275	1,725	149	231	126	27	35	25,045,673	13,279,940	38,325,613	89.4
Maryland	27	46	-	1	-	2	1	272,899	-	272,899	77.5
Missouri	5	5	-	1	-	-	-	46,379	-	46,379	82.2
Montana:											
Bituminous	13	20	1	2	-	-	-	68,143	6,520	74,663	100.0
Lignite	3	6	-	-	-	-	-	8,030	-	8,030	100.0
Total Montana	16	26	1	2	-	-	-	76,173	6,520	82,693	100.0
New Mexico	9	8	-	2	10	-	-	17,749	-	17,749	6.4
North Dakota (lignite)	1	1	-	-	-	-	-	2,059	-	2,059	100.0
Ohio	120	144	45	68	4	-	-	936,835	4,790,785	5,727,620	61.4
Oklahoma	3	16	-	-	-	-	-	80,028	-	80,028	50.4
Pennsylvania	341	637	50	288	312	46	146	7,319,478	4,132,101	11,451,579	27.0
Tennessee	140	234	1	5	9	9	-	3,025,771	5,000	3,030,771	81.5
Utah	37	71	62	4	116	-	65	1,697,582	1,537,159	3,234,741	75.3
Virginia	1,244	1,351	19	51	38	9	4	19,099,510	4,937,529	24,037,039	89.9
Washington	6	35	-	1	-	-	-	114,651	-	114,651	49.2
West Virginia	1,170	2,243	132	722	333	21	46	52,787,200	16,816,879	69,604,079	63.9
Wyoming	8	42	-	12	-	-	-	228,891	-	228,891	100.0
Total	4,660	7,136	608	1,591	1,079	127	324	122,495,429	64,828,510	187,323,939	66.6

TABLE 19.—Number of underground bituminous coal and lignite mines and number of haulage units in use in the United States, in selected years [1]

Year	Underground mines	Locomotives				Rope-haulage units			Shuttle cars			Gathering and haulage conveyors	Animals
		Trolley	Battery	Other types	Total	Portable	Stationary	Total	Cable reel	Battery	Total		
1924	7,352	[2]12.765	1.515	443	14,723	(3)	(3)	649	(3)	(3)	(3)	(3)	36,352
1946	5,888	14,110	1.011	110	15,231	4,084	1.009	5.093	(3)	(3)	(3)	457	10,185
1948	7,108	14,617	904	74	15,595	3,886	1,044	4,930	(3)	(3)	(3)	755	10.834
1949	6,798	14,090	928	59	15,077	3,904	1,073	4,977	2,144	623	2,767	860	10,313
1950	7,559	13,822	949	62	14,833	4,225	1,037	5,262	2,782	512	3,294	1,013	10,033
1951	6,225	13,327	900	51	14.278	3,875	916	4,791	3,191	567	3,758	1,094	7,478
1952	5,632	12,545	812	41	13,398	3,584	852	4,436	3,382	462	3,844	1,066	6,555
1953	5,034	11,311	678	45	12,034	2.838	727	3,565	3.797	425	4,222	1.042	5.354
1954	4,653	10,155	762	38	10,955	1,926	781	2,707	4,400	431	4,831	1,081	5,409
1955	6,035	9,538	658	40	10,236	1.327	577	1.904	4,375	239	4.614	1,002	6,440
1956	6,542	9,445	861	102	10,408	1.420	575	1.995	4,757	257	5,014	1.114	6,097
1957	6,512	8,997	898	138	10,033	1,214	616	1,830	5,129	257	5,386	1.233	5,054
1958	6,319	8,057	920	138	9,115	926	538	1,464	4,871	259	5,130	1.235	4,678
1959	5,815	7,263	949	137	8,349	900	504	1,404	4,795	255	5,050	1,416	4,063
1960	5,989	6,922	946	173	8,041	892	510	1,402	4,722	236	4,958	1,566	3,503
1961	5,843	6,362	583	162	7,107	(4)	(4)	(4)	4,687	182	4,869	1,635	(4)
1962	5,946	5,874	461	123	6,458	(4)	(4)	(4)	4,746	212	4,958	1,786	(4)

[1] Exclusive of lignite and Virginia semianthracite mines in 1946, 1948, and 1949.
[2] Includes combination trolley and battery locomotives.
[3] Data not available.
[4] Canvass discontinued.

TABLE 20.—Haulage units and length of rail track in use in bituminous coal and lignite underground mines in the United States, 1962, by States

State	Locomotives			Tractors, rubber-tired	Mine cars [1]		Shuttle cars		Shuttle buggies	Gathering and haulage conveyors		Rail track reported (miles)		
	Trolley	Battery	All others		Rail	Rubber-tired	Cable reel	Battery		Units	Miles	Main line	All other	Total
Alabama	234			26	4,400	5	211	2		62	23.6	103.9	58.3	162.2
Alaska			2		30							1.0		1.0
Arkansas					68							.9		.9
Colorado	76	35	3		2,857	2	98	16	1	22	6.3	38.4	18.5	56.9
Illinois	128	28		19	3,024		289	3	2	141	56.1	54.1	16.4	70.5
Indiana	91	3	5		1,594		90	4	1	24	7.2	51.1	30.3	81.4
Iowa	4	2			598		4					9.7	.7	10.4
Kentucky	757	117	35	216	9,388	859	787	42	521	198	73.5	341.7	126.8	468.5
Maryland	9	9	1	2	226	10			6	1	.4	6.7	2.0	8.7
Missouri		2			194							2.8	.5	3.3
Montana:														
Bituminous	13	2			297		8					7.0	3.0	10.0
Lignite				1	20	3						.1		.1
Total Montana	13	2		1	317	3	8					7.1	3.0	10.1
New Mexico	10	1		1	192		12	1		2	.8	7.2	3.4	10.6
Ohio	213	26	2	8	3,336	8	118		3	49	11.0	92.4	35.1	127.5
Oklahoma		5			12							.5	.2	.7
Pennsylvania	1,628	83	24	31	34,468	27	912	27	10	360	111.6	840.5	333.0	1,173.5
Tennessee	85	11		7	899	50	40	16	33	12	3.9	38.7	14.9	53.6
Utah	120	6		5	3,425	7	173	6	1	56	10.4	77.2	24.9	102.1
Virginia	539	56	32	688	4,723	3,691	109	1	13	102	40.6	106.2	48.4	154.6
Washington	16				467		2					1.6		1.6
West Virginia	1,941	71	19	175	43,389	783	1,875	94	571	754	214.9	960.5	403.1	1,363.6
Wyoming	10	4			496		18			3	.9	12.7	9.5	22.2
Total	5,874	461	123	1,179	114,103	5,445	4,746	212	1,162	1,786	561.2	2,754.9	1,129.0	3,883.9

---

[1] See table 21 for percentage coverage.

TABLE 21.—Method of haulage at bituminous coal and lignite underground mines in the United States, 1962, by States

State	Production (net tons) from mines—					Percentage of total underground production, from mines—				
	Reporting rail mine cars	Reporting rubber-tired mine cars	With conveyor haulage only	Not reporting type of haulage	Total	Reporting rail mine cars	Reporting rubber-tired mine cars	With conveyor haulage only	Not reporting type of haulage	Total
Alabama	5, 354, 901	------	3, 799, 147	836, 030	9, 990, 078	53. 6	------	38. 0	8. 4	100. 0
Alaska	109, 813	------	------	------	109, 813	100. 0	------	------	------	100. 0
Arkansas	28, 408	------	------	61, 204	89, 612	31. 7	------	------	68. 3	100. 0
Colorado	1, 397, 483	18, 226	1, 119, 439	283, 669	2, 818, 817	49. 6	0. 6	39. 7	10. 1	100. 0
Illinois	7, 814, 029	------	15, 410, 227	678, 055	23, 902, 311	32. 7	------	64. 5	2. 8	100. 0
Indiana	3, 377, 425	------	1, 006, 029	16, 517	4, 399, 971	76. 7	------	22. 9	. 4	100. 0
Iowa	163, 682	------	------	------	163, 682	100. 0	------	------	------	100. 0
Kentucky	17, 406, 778	2, 216, 891	10, 514, 418	12, 730, 004	42, 868, 091	40. 6	5. 2	24. 5	29. 7	100. 0
Maryland	127, 772	26, 355	62, 444	135, 445	352, 016	36. 3	7. 5	17. 7	38. 5	100. 0
Missouri	36, 641	------	------	19, 778	56, 419	64. 9	------	------	35. 1	100. 0
Montana:										
Bituminous	69, 987	------	------	4, 676	74, 663	93. 7	------	------	6. 3	100. 0
Lignite	3, 037	1, 318	------	3, 675	8, 030	37. 8	16. 4	------	45. 8	100. 0
Total Montana	73, 024	1, 318	------	8, 351	82, 693	88. 3	1. 6	------	10. 1	100. 0
New Mexico	233, 365	------	------	45, 877	279, 242	83. 6	------	------	16. 4	100. 0
Ohio	7, 754, 719	22, 283	1, 476, 666	80, 330	9, 333, 998	83. 1	. 2	15. 8	. 9	100. 0
Oklahoma	4, 724	------	------	154, 181	158, 905	3. 0	------	------	97. 0	100. 0
Pennsylvania	37, 821, 933	219, 585	3, 694, 614	744, 581	42, 480, 713	89. 0	. 5	8. 7	1. 8	100. 0
Tennessee	1, 660, 517	116, 680	226, 742	1, 716, 779	3, 720, 718	44. 6	3. 1	6. 1	46. 2	100. 0
Utah	3, 627, 768	15, 498	499, 599	154, 155	4, 297 020	84. 4	. 4	11. 6	3. 6	100. 0
Virginia	6, 085, 917	7, 753, 407	6, 652, 216	6, 236, 670	26, 728, 210	22. 8	29. 0	24. 9	23. 3	100. 0
Washington	221, 660	------	------	11, 182	232, 842	95. 2	------	------	4. 8	100. 0
West Virginia	78, 116, 711	1, 910, 665	19, 125, 588	9, 807, 284	108, 960, 248	71. 7	1. 8	17. 5	9. 0	100. 0
Wyoming	135, 719	------	------	93, 172	228, 891	59. 3	------	------	40. 7	100. 0
Other States [1]	------	------	------	12, 078	12, 078	------	------	------	100. 0	100. 0
Total	171, 552, 989	12, 300, 908	63, 587, 129	33, 825, 342	281, 266, 368	61. 0	4. 4	22. 6	12. 0	100. 0

[1] Includes Georgia, Kansas, and North Dakota (lignite)

TABLE 22.—Rail mine cars used at bituminous coal and lignite underground mines in the United States, 1962, by States[1]

State	Capacity						
	1 ton	2 tons	3 tons	4-5 tons	6-9 tons	10 tons and over	Total
NUMBER REPORTED							
Alabama	151	19	797	2,069	1,026	338	4,400
Alaska	----------	----------	----------	----------	----------	30	30
Arkansas	12	56	----------	----------	----------	----------	68
Colorado	199	2,081	232	336	----------	9	2,857
Illinois	565	1,223	111	152	914	59	3,024
Indiana	57	163	414	560	400	----------	1,594
Iowa	406	172	20	----------	----------	----------	598
Kentucky	413	1,993	2,069	3,000	345	1,568	9,388
Maryland	152	70	4	----------	----------	----------	226
Missouri	194	----------	----------	----------	----------	----------	194
Montana:							
Bituminous	16	66	191	15	9	----------	297
Lignite	20	----------	----------	----------	----------	----------	20
Total Montana	36	66	191	15	9	----------	317
New Mexico	89	9	----------	----------	----------	94	192
Ohio	843	350	519	30	839	755	3,336
Oklahoma	----------	4	8	----------	----------	----------	12
Pennsylvania	4,541	5,917	7,609	4,634	9,350	2,417	34,468
Tennessee	383	68	135	210	103	----------	899
Utah	----------	21	309	1,742	1,353	----------	3,425
Virginia	644	583	1,038	1,914	244	300	4,723
Washington	425	----------	15	27	----------	----------	467
West Virginia	401	3,635	10,532	15,923	5,481	7,417	43,389
Wyoming	----------	----------	----------	496	----------	----------	496
Total	9,511	16,430	24,003	31,108	20,064	12,987	114,103
PERCENTAGE OF TOTAL							
Alabama	3.4	0.5	18.1	47.0	23.3	7.7	100.0
Alaska	----------	----------	----------	----------	----------	100.0	100.0
Arkansas	17.6	82.4	----------	----------	----------	----------	100.0
Colorado	7.0	72.8	8.1	11.8	----------	.3	100.0
Illinois	18.7	40.4	3.8	5.0	30.2	1.9	100.0
Indiana	3.6	10.2	26.0	35.1	25.1	----------	100.0
Iowa	67.9	28.8	3.3	----------	----------	----------	100.0
Kentucky	4.4	21.2	22.0	32.0	3.7	16.7	100.0
Maryland	67.2	31.0	1.8	----------	----------	----------	100.0
Missouri	100.0	----------	----------	----------	----------	----------	100.0
Montana:							
Bituminous	5.4	22.2	64.3	5.1	3.0	----------	100.0
Lignite	100.0	----------	----------	----------	----------	----------	100.0
Total Montana	11.4	20.8	60.3	4.7	2.8	----------	100.0
New Mexico	46.3	4.7	----------	----------	----------	49.0	100.0
Ohio	25.3	10.5	15.6	.9	25.1	22.6	100.0
Oklahoma	----------	33.3	66.7	----------	----------	----------	100.0
Pennsylvania	13.2	17.2	22.1	13.4	27.1	7.0	100.0
Tennessee	42.6	7.6	15.0	23.3	11.5	----------	100.0
Utah	----------	.6	9.0	50.9	39.5	----------	100.0
Virginia	13.6	12.3	22.0	40.5	5.2	6.4	100.0
Washington	91.0	----------	3.2	5.8	----------	----------	100.0
West Virginia	.9	8.4	24.3	36.7	12.6	17.1	100.0
Wyoming	----------	----------	----------	100.0	----------	----------	100.0
Total	8.3	14.4	21.0	27.3	17.6	11.4	100.0

---

[1] See table 21 for percentage coverage.

TABLE 23.—Rail mine car haulage at bituminous coal and lignite underground mines in the United States, 1962, by States [1]

State	Production, by size of mine car reported						
	1 ton	2 tons	3 tons	4-5 tons	6-9 tons	10 tons and over	Total
			NET TONS				
Alabama	53,518	10,514	381,756	1,904,866	2,168,805	835,442	5,354,901
Alaska	----------	----------	----------	----------	----------	109,813	109,813
Arkansas	14,000	14,408	----------	----------	----------	----------	28,408
Colorado	181,240	815,545	38,028	326,407	----------	36,263	1,397,483
Illinois	203,395	585,989	151,745	766,708	5,022,878	1,083,314	7,814,029
Indiana	62,900	141,357	678,059	2,074,381	420,728	----------	3,377,425
Iowa	46,433	78,547	38,702	----------	----------	----------	163,682
Kentucky	322.804	1,641,689	2,875,894	6,670,714	830,742	5,064,935	17,406,778
Maryland	63,644	8,681	55,447	----------	----------	----------	127,772
Missouri	36.641	----------	----------	----------	----------	----------	36,641
Montana:							
Bituminous	4,843	15,038	36,609	6,520	6,977	----------	69,987
Lignite	3,037	----------	----------	----------	----------	----------	3,037
Total Montana	7,880	15,038	36,609	6,520	6,977	----------	73,024
New Mexico	22,261	1,200	----------	----------	----------	209,904	233,365
Ohio	347,410	130,116	1,498,884	28,007	2,661,010	3,089,292	7,754,719
Oklahoma	----------	2,064	2,660	----------	----------	----------	4,724
Pennsylvania	1,331,050	2,007,803	4,449,786	5,837,488	16,692,003	7,503,803	37,821,933
Tennessee	184,265	57,698	560,681	784,070	73,803	----------	1,660,517
Utah	----------	19,509	196,187	1,452,567	1,959,505	----------	3,627,768
Virginia	335,382	901,616	1,185,692	1,611,882	688,532	1,362,813	6,085,917
Washington	171,898	----------	3,835	45,927	----------	----------	221,660
West Virginia	264,498	3,400,013	9,190,040	24,975,965	12,388,701	27,897,494	78,116,711
Wyoming	----------	----------	----------	135,719	----------	----------	135,719
Total	3,649,219	9,831,787	21,344,005	46,621,221	42,913,684	47,193,073	171,552,989
			PERCENTAGE OF TOTAL				
Alabama	1.0	0.2	7.1	35.6	40.5	15.6	100.0
Alaska	----------	----------	----------	----------	----------	100.0	100.0
Arkansas	49.3	50.7	----------	----------	----------	----------	100.0
Colorado	13.0	58.4	2.7	23.3	----------	2.6	100.0
Illinois	2.6	7.5	1.9	9.8	64.3	13.9	100.0
Indiana	1.9	4.2	20.1	61.4	12.4	----------	100.0
Iowa	28.4	48.0	23.6	----------	----------	----------	100.0
Kentucky	1.9	9.4	16.5	38.3	4.8	29.1	100.0
Maryland	49.8	6.8	43.4	----------	----------	----------	100.0
Missouri	100.0	----------	----------	----------	----------	----------	100.0
Montana:							
Bituminous	6.9	21.5	52.3	9.3	10.0	----------	100.0
Lignite	100.0	----------	----------	----------	----------	----------	100.0
Total Montana	10.8	20.6	50.1	8.9	9.6	----------	100.0
New Mexico	9.5	.5	----------	----------	----------	90.0	100.0
Ohio	4.5	1.7	19.3	.4	34.3	39.8	100.0
Oklahoma	----------	43.7	56.3	----------	----------	----------	100.0
Pennsylvania	3.5	5.3	11.8	15.4	44.1	19.9	100.0
Tennessee	11.1	3.5	33.8	47.2	4.4	----------	100.0
Utah	----------	.5	5.4	40.1	54.0	----------	100.0
Virginia	5.5	14.8	19.5	26.5	11.3	22.4	100.0
Washington	77.6	----------	1.7	20.7	----------	----------	100.0
West Virginia	.3	4.3	11.8	32.0	15.9	35.7	100.0
Wyoming	----------	----------	----------	100.0	----------	----------	100.0
Total	2.1	5.7	12.5	27.2	25.0	27.5	100.0

---

[1] See table 21 for percentage coverage.

TABLE 24.—Rubber-tired mine cars used at bituminous coal and lignite underground mines in the United States, 1962, by States [1]

State	Capacity						
	1 ton	2 tons	3 tons	4–5 tons	6–9 tons	10 tons and over	Total
				NUMBER REPORTED			
Colorado						2	2
Kentucky	356	359	119	25			859
Maryland		10					10
Montana (lignite)		3					3
Ohio		6		2			8
Pennsylvania	8	10	9				27
Tennessee	10	39	1				50
Utah		5				2	7
Virginia	1,277	2,186	159	66		3	3,691
West Virginia	167	470	115	31			783
Total	1,818	3,088	403	124		7	5,440
				PERCENTAGE OF TOTAL			
Colorado						100.0	100.0
Kentucky	41.4	41.8	13.9	2.9			100.0
Maryland		100.0					100.0
Montana (lignite)		100.0					100.0
Ohio		75.0		25.0			100.0
Pennsylvania	29.6	37.1	33.3				100.0
Tennessee	20.0	78.0	2.0				100.0
Utah		71.4				28.6	100.0
Virginia	34.6	59.2	4.3	1.8		.1	100.0
West Virginia	21.3	60.0	14.7	4.0			100.0
Total	33.4	56.8	7.4	2.3		.1	100.0

[1] See table 21 for percentage coverage.

TABLE 25.—Rubber-tired mine car haulage at bituminous coal and lignite underground mines in the United States, 1962, by States [1]

State	Production, by size of mine car reported						
	1 ton	2 tons	3 tons	4–5 tons	6–9 tons	10 tons and over	Total
				NET TONS			
Colorado						18,226	18,226
Kentucky	629,095	1,062,188	452,983	72,625			2,216,891
Maryland		26,355					26,355
Montana (lignite)		1,318					1,318
Ohio		22,283					22,283
Pensylvania		19,822	199,763				219,585
Tennessee	8,249	72,431	36,000				116,680
Utah						15,498	15,498
Virginia	2,204,534	4,854,139	544,582	133,032		17,120	7,753,407
West Virginia	214,557	1,000,947	339,659	355,502			1,910,665
Total	3,056,435	7,059,483	1,572,987	561,159		50,844	12,300,908
				PERCENTAGE OF TOTAL			
Colorado						100.0	100.0
Kentucky	28.4	47.9	20.4	3.3			100.0
Maryland		100.0					100.0
Montana (lignite)		100.0					100.0
Ohio		100.0					100.0
Pennsylvania		9.0	91.0				100.0
Tenessee	7.1	62.1	30.8				100.0
Utah						100.0	100.0
Virginia	28.5	62.6	7.0	1.7		.2	100.0
West Virginia	11.2	52.4	17.8	18.6			100.0
Total	24.8	57.4	12.8	4.6		.4	100.0

[1] See table 21 for percentage coverage.

TABLE 26.—Number and production of underground bituminous coal and lignite mines using gathering and haulage conveyors, and number and length of units in use in the United States [1]

Year	Number of mines	Production (net tons)	Number of units in use	Average length (feet)	Total length (miles)
1945	117	40, 189, 857	359	1, 438	97. 6
1946	161	46, 022, 710	457	1, 484	128. 5
1947	199	70, 690, 920	594	1, 470	165. 3
1948	270	81, 821, 361	755	1, 460	208. 8
1949	314	69, 947, 713	860	1, 514	246. 7
1950	374	92, 413, 644	1, 013	1, 538	294. 9
1951	372	99, 643, 003	1, 094	1, 568	325. 0
1952	358	92, 168, 992	1, 066	1, 526	308. 2
1953	322	100, 155, 249	1, 042	1. 541	303. 9
1954	291	83, 211, 284	1, 081	1, 626	32. 9
1955	314	97, 677, 313	1, 002	1, 682	319. 6
1956	314	126, 717, 518	1, 114	1, 656	349. 4
1957	362	136, 914, 192	1, 233	1, 672	390. 4
1958	366	115, 419, 740	1, 235	1, 711	400. 3
1959	371	126, 654, 911	1, 416	1, 723	462. 1
1960	396	137, 053, 564	1, 566	1, 673	499. 2
1961	414	140, 938, 297	1, 635	1, 655	512. 6
1962	430	153, 251, 478	1, 786	1, 659	561. 2

---

[1] Includes all gathering and haulage conveyors with capacity over 500 feet, except main-slope conveyors. Excludes lignite and Virginia semianthracite mines in 1945–49.

TABLE 27.—Number and production of underground bituminous coal and lignite mines using gathering and haulage conveyors, and number and length of units in use in the United States, by States [1]

State	Number of mines		Production (net tons)		Number of units in use		Average length (feet)		Total length (miles)	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	7	8	4, 688, 851	5, 830, 775	58	62	2, 035	2, 013	22. 4	23. 6
Arkansas	1	------	66, 651	------------	3	-------	1, 000	-------	. 2	------
Colorado	7	6	1, 451, 251	1, 156, 592	23	22	1, 420	1, 516	6. 2	6. 3
Illinois	15	16	18, 860, 233	21, 704, 786	129	141	2, 153	2, 102	52. 6	56. 1
Indiana	6	6	3, 429, 334	3, 423, 827	23	24	1, 391	1, 574	6. 1	7. 2
Kentucky	39	46	15, 007, 358	19, 149. 313	151	198	1, 500	1, 960	42. 9	73. 5
Maryland	1	1	30, 272	62, 444	1	1	2, 000	2, 000	. 4	. 4
New Mexico	1	2	360, 768	251, 670	1	2	2, 400	2, 200	. 5	. 8
Ohio	13	12	4, 594, 109	5, 222. 112	37	49	1, 892	1, 190	13. 3	11. 0
Pennsylvania	62	72	19, 462, 581	20, 217. 879	295	360	1, 515	1, 637	84. 7	111. 6
Tennessee	6	6	354, 691	305, 647	10	12	1, 600	1, 700	3. 0	3. 9
Utah	16	17	3, 499, 236	3, 458, 913	44	56	1, 207	985	10. 1	10. 4
Virginia	16	21	10, 496, 524	9, 506, 570	118	102	1, 980	2, 104	44. 3	40. 6
West Virginia	223	216	58, 578, 352	62, 898, 700	739	754	1, 607	1, 505	225. 0	214. 9
Wyoming	1	1	58, 086	62, 250	3	3	1, 500	1, 500	. 9	. 9
Total	414	430	140, 938, 297	153, 251, 478	1, 635	1, 786	1, 655	1, 659	512. 6	561. 2

---

[1] Includes all mines using belt conveyors, other than main-slope conveyors, 500 feet long or more for transporting coal underground.

STRIP MINING

Strip mines have two substantial advantages over underground mines: (1) The output per man per day in strip mines is more than double that in underground mines, and (2) the average value of strip coal, f.o.b. mines, is about one-third less than the average value of coal from underground mines. See figures 9 and 10.

The rapid growth of strip mining was made possible by the development of larger and improved stripping and drilling equipment and trucks.

An increase in the average capacity of trucks used in strip mines has reduced the number required. The average hauling distance from strip mines to tipples or ramps is approximately 5 miles.

The average thickness of overburden at all bituminous coal and lignite strip mines in the United States was 46 feet in 1960, the latest year for which figures are available. Several strip mines handled an average of more than 70 feet of overburden in 1960, and a few handled more than 80 feet.

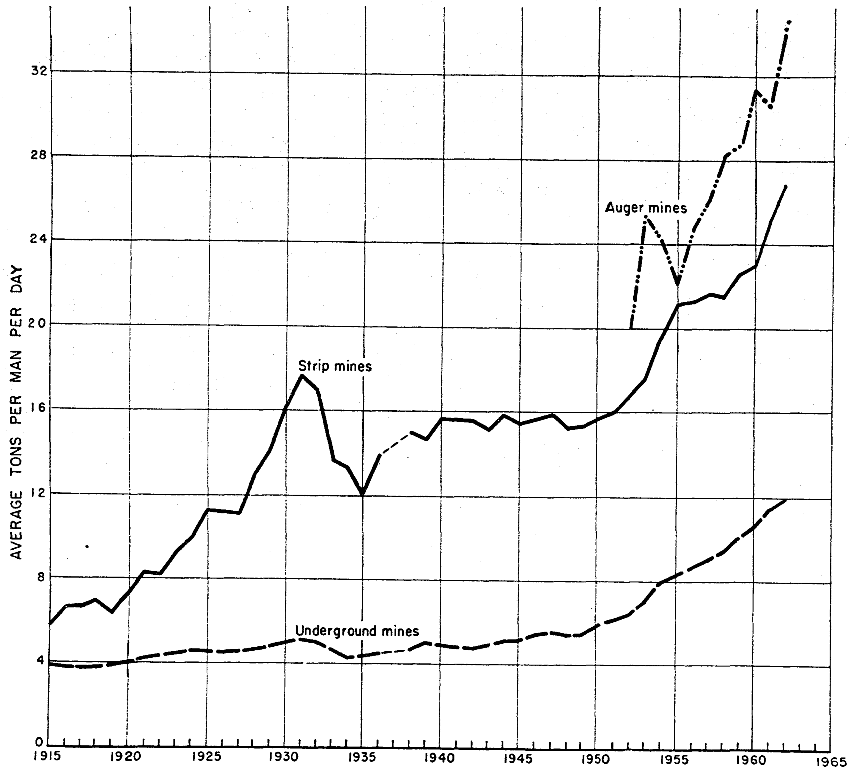


FIGURE 9.—Average tons per man per day at bituminous coal and lignite mines in the United States, 1915–62, by underground, strip, and auger mines.

TABLE 28.—Growth of strip mining at bituminous coal and lignite mines in the United States, compared with underground and auger mining

Year	Production (thousand net tons)				Percentage of total mined by stripping	Average tons per man per day				Average value per ton f.o.b. mine				Number of strip mines	Number of power shovels and draglines
	Underground mines	Strip mines [1]	Auger mines	Total		Underground mines	Strip mines [1]	Auger mines	Total	Underground mines	Strip mines [1]	Auger mines	Total		
1914	421,423	1,281	----------	422,704	0.3	3.71	5.06	----------	3.71	(2)	(2)	----------	$1.17	[3] 35	48
1915	439,792	2,832	----------	442,624	.6	3.90	5.81	----------	3.91	$1.13	$1.18	----------	1.13	[3] 60	87
1916	498,587	3,933	----------	502,520	.8	3.88	6.67	----------	3.90	1.32	1.51	----------	1.32	[3] 79	111
1917	546,001	5,790	----------	551,791	1.0	3.75	6.52	----------	3.77	2.26	2.34	----------	2.26	[3] 126	182
1918	571,098	8,288	----------	579,386	1.4	3.76	6.81	----------	3.78	2.58	2.54	----------	2.58	[3] 165	276
1919	460,225	5,635	----------	465,860	1.2	3.82	6.21	----------	3.84	2.49	2.33	----------	2.49	[3] 168	287
1920	559,807	8,860	----------	568,667	1.5	3.97	7.20	----------	4.00	3.74	4.12	----------	3.75	[3] 174	312
1921	410,865	5,057	----------	415,922	1.2	4.18	8.28	----------	4.20	2.89	2.87	----------	2.89	[3] 155	279
1922	412,059	10,209	----------	422,268	2.4	4.24	8.09	----------	4.28	3.02	3.07	----------	3.02	272	379
1923	552,625	11,940	----------	564,565	2.1	4.43	9.32	----------	4.47	2.69	2.31	----------	2.68	263	442
1924	470,080	13,607	----------	483,687	2.8	4.50	9.91	----------	4.56	2.20	2.00	----------	2.20	234	420
1925	503,182	16,871	----------	520,053	3.2	4.45	11.18	----------	4.52	2.05	1.84	----------	2.04	227	389
1926	556,444	16,923	----------	573,367	3.0	4.42	11.13	----------	4.50	2.07	1.89	----------	2.06	237	410
1927	499,385	18,378	----------	517,763	3.6	4.47	11.06	----------	4.55	1.99	1.90	----------	1.99	255	455
1928	480,956	19,789	----------	500,745	4.0	4.61	13.02	----------	4.73	1.87	1.69	----------	1.86	250	415
1929	514,721	20,268	----------	534,989	3.8	4.73	14.08	----------	4.85	1.79	1.57	----------	1.78	200	411
1930	447,684	19,842	----------	467,526	4.3	4.93	16.21	----------	5.06	1.71	1.54	----------	1.70	218	341
1931	363,157	18,932	----------	382,089	5.0	5.12	17.68	----------	5.30	1.54	1.51	----------	1.54	235	314
1932	290,069	19,641	----------	309,710	6.3	4.99	16.95	----------	5.22	1.31	1.32	----------	1.31	255	332
1933	315,360	18,270	----------	333,630	5.5	4.60	13.59	----------	4.78	1.34	1.33	----------	1.34	289	389
1934	338,578	20,790	----------	359,368	5.8	4.23	13.28	----------	4.40	1.76	1.49	----------	1.75	344	458
1935	348,726	23,647	----------	372,373	6.4	4.32	12.01	----------	4.50	1.79	1.47	----------	1.77	368	507
1936	410,962	28,126	----------	439,088	6.4	4.42	13.91	----------	4.62	1.77	1.49	----------	1.76	381	562
1937	413,780	31,751	----------	445,531	7.1	(2)	(2)	----------	4.69	(2)	(2)	----------	1.94	449	(2)
1938	318,138	30,407	----------	348,545	8.7	4.60	15.00	----------	4.89	(2)	(2)	----------	1.95	465	737
1939	357,133	37,722	----------	394,855	9.6	4.92	14.68	----------	5.25	1.88	1.49	----------	1.84	537	914
1940	417,604	43,167	----------	460,771	9.4	4.86	15.63	----------	5.19	1.94	1.56	----------	1.91	638	1,071
1941	459,078	55,071	----------	514,149	10.7	4.83	15.59	----------	5.20	2.23	1.79	----------	2.19	769	1,321
1942	515,490	67,203	----------	582,693	11.5	4.74	15.52	----------	5.12	2.41	1.90	----------	2.36	834	1,438
1943	510,492	79,685	----------	590,177	13.5	4.89	15.15	----------	5.38	2.75	2.28	----------	2.69	1,004	1,830
1944	518,678	100,898	----------	619,576	16.3	5.04	15.89	----------	5.67	3.01	2.48	----------	2.92	1,240	2,312

See footnotes at end of table.

TABLE 28.—Growth of strip mining at bituminous coal and lignite mines in the United States, compared with underground mining—Continued

Year	Production (thousand net tons)				Percentage of total mined by stripping	Average tons per man per day				Average value per ton f.o.b. mine				Number of strip mines	Number of power shovels and draglines
	Underground mines	Strip mines [1]	Auger mines	Total		Underground mines	Strip mines [1]	Auger mines	Total	Underground mines	Strip mines [1]	Auger mines	Total		
1945	467,630	109,987	----------	577,617	19.0	5.04	15.46	----------	5.78	$3.16	$2.65	----------	$3.06	1,370	2,439
1946	420,958	112,964	----------	533,922	21.1	5.43	15.73	----------	6.30	3.59	2.87	----------	3.44	1,445	2,744
1947	491,229	139,395	----------	630,624	22.1	5.49	15.93	----------	6.42	4.35	3.47	----------	4.16	1,750	3,254
1948	460,012	139,506	----------	599,518	23.3	5.31	15.28	----------	6.26	5.26	4.11	----------	4.99	1,971	3,712
1949	331,823	106,045	----------	437,868	24.2	5.42	15.33	----------	6.43	5.18	3.94	----------	4.88	1,761	3,576
1950	392,844	123,467	----------	516,311	23.9	5.75	15.66	----------	6.77	5.15	3.87	----------	4.84	1,870	3,877
1951	415,842	117,618	205	533,665	22.0	6.08	16.02	----------	7.04	5.21	3.88	----------	4.92	1,784	3,810
1952	356,425	108,910	1,506	466,841	23.3	6.37	16.77	20.07	7.47	5.24	3.81	$4.31	4.90	1,643	3,527
1953	349,551	105,448	2,291	457,290	23.1	7.01	17.62	25.30	8.17	5.27	3.75	4.15	4.92	1,554	3,390
1954	289,112	98,134	4,460	391,706	25.1	7.99	19.64	24.12	9.47	4.87	3.52	3.41	4.52	1,329	3,409
1955	343,465	115,093	6,075	464,633	24.8	8.28	21.12	22.22	9.84	4.86	3.48	3.60	4.50	1,617	3,265
1956	365,774	127,055	8,045	500,874	25.4	8.62	21.18	24.85	10.28	5.20	3.74	4.17	4.82	1,728	3,705
1957	360,649	124,109	7,946	492,704	25.2	8.91	21.64	26.19	10.59	5.52	3.89	4.12	5.08	1,756	3,723
1958	286,884	116,242	7,320	410,446	28.3	9.38	21.54	28.15	11.33	5.33	3.80	3.60	4.86	1,646	3,515
1959	283,434	120,953	7,641	412,028	29.4	10.08	22.65	28.77	12.22	5.23	3.76	3.83	4.77	1,594	3,417
1960	284,888	122,630	7,994	415,512	29.5	10.64	22.93	31.36	12.83	5.14	3.74	3.37	4.69	1,530	3,313
1961	272,766	121,979	8,232	402,977	30.3	11.41	25.00	30.61	13.87	5.02	3.67	3.24	4.58	1,477	3,204
1962	281,266	130,300	10,583	422,149	30.9	11.97	26.76	34.61	14.72	4.91	3.64	3.33	4.48	1,429	3,185

---

[1] Includes power strip pits proper and excludes horse stripping operations and mines combining stripping and underground in the same operation for the period 1914–42. The years 1943–62 include data on all strip mines.

[2] Data not available.

[3] Exclusive of horse stripping operations.

TABLE 29.—Number and production of bituminous coal and lignite strip mines and units of stripping and loading equipment in use in the United States

Year	Number of strip mines	Production (thousand net tons)	Number of power shovels and dragline excavators												Number of carryall scrapers	Number of bulldozers
			By type of power					By capacity of dipper or bucket, cubic yards				By type of machine		Total		
			Electric	Diesel-electric	Diesel	Gasoline	Steam	Less than 3	3-5	6-12	More than 12	Power shovels	Dragline excavators			
1932	255	19,641	[1] 105	(2)	[3] 61	(4)	166	(5)	(5)	(5)	(5)	(5)	(5)	332	(5)	(5)
1933	289	18,270	[1] 117	(2)	[3] 103	(4)	169	(5)	(5)	(5)	(5)	(5)	(5)	389	(5)	(5)
1934	344	20,790	[1] 121	(2)	[3] 149	(4)	188	(5)	(5)	(5)	(5)	(5)	(5)	458	(5)	(5)
1935	368	23,647	[1] 139	(2)	[3] 194	(4)	174	(5)	(5)	(5)	(5)	(5)	(5)	507	(5)	(5)
1936	381	28,126	[1] 151	(2)	[3] 223	(4)	188	(5)	(5)	(5)	(5)	(5)	(5)	562	(5)	(5)
1937	449	31,751	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
1938	465	30,407	[1] 155	(2)	[3] 440	(4)	142	(5)	(5)	(5)	(5)	(5)	(5)	737	(5)	(5)
1939	537	37,722	[1] 184	(2)	[3] 524	(4)	206	(5)	(5)	(5)	(5)	(5)	(5)	914	(5)	(5)
1940	638	43,167	[1] 194	(2)	[3] 697	(4)	180	(5)	(5)	(5)	(5)	(5)	(5)	1,071	(5)	(5)
1941	769	55,071	[1] 210	(2)	[3] 911	(4)	200	1,009	153	95	64	(5)	(5)	1,321	(5)	(5)
1942	834	67,203	[1] 219	(2)	[3] 1,020	(4)	199	1,114	159	97	68	(5)	(5)	1,438	(5)	(5)
1943	1,004	79,685	[1] 234	(2)	[3] 1,433	(4)	172	1,488	173	106	72	(5)	(5)	1,839	(5)	(5)
1944	1,240	100,898	[1] 244	(2)	[3] 1,902	(4)	166	1,900	225	113	74	(5)	(5)	2,312	(5)	(5)
1945	1,370	109,987	[1] 256	(2)	[3] 2,042	(4)	141	2,004	243	117	75	(5)	(5)	2,439	(5)	(5)
1946	1,445	112,964	[1] 261	(2)	1,619	753	111	2,256	302	112	74	2,406	338	2,744	263	(5)
1947	1,750	139,395	[1] 301	(2)	2,279	591	83	2,685	362	123	84	2,822	432	3,254	275	(5)
1948	1,971	139,506	[1] 337	(2)	2,675	646	54	3,048	446	130	88	3,177	535	3,712	362	(5)
1949	1,761	106,045	[1] 352	(2)	2,646	527	51	2,931	367	168	110	3,011	565	3,576	320	(5)
1950	1,870	123,467	[1] 348	(2)	2,880	607	42	3,182	416	170	109	3,247	630	3,877	286	(5)
1951	1,784	117,618	[1] 346	(2)	2,905	533	26	3,088	420	187	115	3,164	646	3,810	220	(5)
1952	1,643	108,910	[1] 321	(2)	2,642	545	19	2,800	425	183	119	2,892	635	3,527	218	(5)
1953	1,554	105,448	[1] 317	(2)	2,629	446	17	2,692	413	193	111	2,793	616	3,409	244	1,954
1954	1,329	98,134	[1] 381	(2)	2,617	374	18	2,480	579	211	120	2,605	785	3,390	269	2,599
1955	1,617	115,093	[1] 315	(2)	2,603	337	10	2,381	550	223	111	2,592	673	3,265	187	2,106
1956	1,728	127,055	285	136	2,914	365	5	2,693	634	249	129	2,899	806	3,705	226	2,381
1957	1,756	124,109	325	164	2,839	389	6	2,748	566	266	143	2,894	829	3,723	215	2,499
1958	1,646	116,242	315	273	2,607	315	5	2,507	591	275	142	2,704	811	3,515	173	2,472
1959	1,594	120,953	309	215	2,579	307	7	2,435	572	267	143	2,607	810	3,417	161	2,443
1960	1,530	122,630	311	194	2,519	285	4	2,315	588	265	145	2,521	792	3,313	163	2,345
1961	1,477	121,979	286	210	2,455	253	(6)	2,162	606	299	137	2,412	792	3,204	152	2,341
1962	1,429	130,300	296	214	2,423	252	(6)	2,111	597	335	142	2,353	832	3,185	146	2,330

[1] Includes diesel-electric shovels.
[2] Included with electric shovels.
[3] Includes gasoline shovels.
[4] Included with diesel shovels.
[5] Data not available.
[6] Canvass discontinued

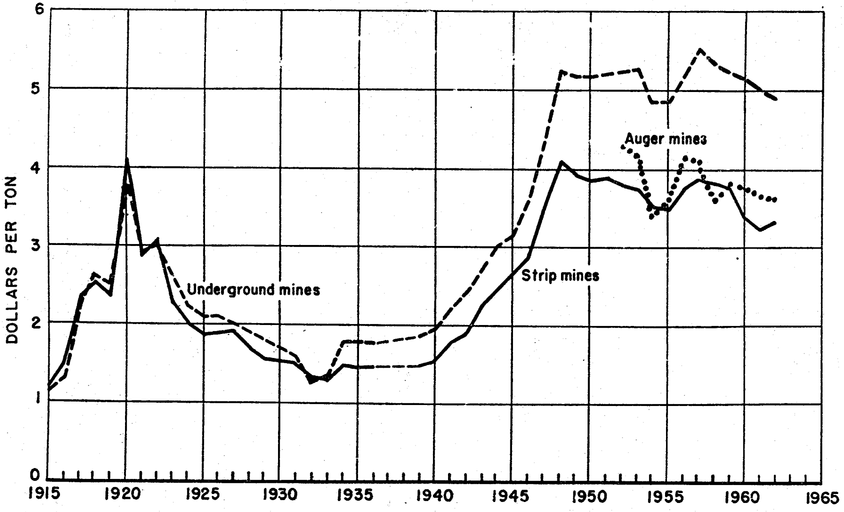


FIGURE 10.—Average value per ton, f.o.b. mines, of bituminous coal and lignite produced in the United States, 1915–62, by underground, strip, and auger mines.

TABLE 30.—Number and production of bituminous coal and lignite strip mines and units of stripping and loading equipment in use in the United States, 1962. by States

State	Number of strip mines	Production (net tons)	Number of power shovels and dragline excavators											Number of carry-al scrapers	Number of bull-dozers
			By type of power				By capacity of dipper or bucket, cubic yards				By type of machine		Total		
			Electric	Diesel electric	Diesel	Gas	Less than 3	3-5	6-12	More than 12	Power shovels	Dragline excavators			
Alabama	42	2,773,953	6	5	72	5	55	15	14	4	69	19	88	5	65
Alaska	5	761,566	-----	-----	11	-----	8	2	1	-----	10	1	11	-----	23
Arkansas	7	166.127	-----	2	7	-----	5	2	2	-----	3	6	9	1	6
Colorado	8	560.583	4	3	7	-----	5	5	3	1	8	6	14	3	14
Illinois	63	24,585.051	92	4	49	5	31	25	47	47	93	57	150	1	138
Indiana	38	11,308,931	39	8	44	11	39	27	21	15	61	41	102	4	89
Iowa	22	965,882	4	1	36	9	33	14	2	1	27	23	50	2	36
Kansas	10	912.810	9	1	7	1	7	3	4	4	10	8	18	1	9
Kentucky:															
Eastern	57	2,206,579	1	5	89	4	84	12	3	-----	97	2	99	1	67
Western	43	20,231,748	36	9	60	7	38	32	25	17	81	31	112	-----	91
Total Kentucky	100	22,438,327	37	14	149	11	122	44	28	17	178	33	211	1	158
Maryland	29	468,605	-----	2	36	9	45	1	1	-----	40	7	47	-----	41
Missouri	19	2.839,548	12	5	16	6	21	6	4	8	21	18	39	-----	39
Montana:															
Bituminous	1	3,000	-----	-----	1	-----	1	-----	-----	-----	1	-----	1	1	-----
Lignite	2	296,466	1	-----	1	1	1	1	1	-----	2	1	3	1	2
Total Montana	3	299,466	1	-----	2	1	2	1	1	-----	3	1	4	2	2
New Mexico	2	397,915	-----	1	2	-----	1	-----	2	-----	-----	3	3	-----	6
North Dakota (lignite)	32	2,730,795	19	4	17	10	27	12	10	1	38	12	50	26	41
Ohio	266	23,441,780	44	42	429	65	362	133	60	25	430	150	580	45	493
Oklahoma	12	889,143	8	4	8	-----	9	3	3	5	10	10	20	-----	19
Pennsylvania	526	22,207,175	13	88	1,154	102	993	236	114	14	946	411	1,357	29	767
South Dakota (lignite)	1	17,914	-----	1	1	-----	2	-----	-----	-----	1	1	2	1	1
Tennessee	54	2,275,233	-----	1	75	6	65	14	3	-----	74	8	82	2	53
Virginia	44	1,792,473	-----	5	72	1	76	2	-----	-----	77	1	78	-----	65
Washington	1	2,115	-----	-----	-----	1	1	-----	-----	-----	1	-----	1	-----	1
West Virginia	135	6,124,999	2	21	223	6	193	47	12	-----	242	10	252	9	241
Wyoming	10	2,339,833	6	2	6	3	9	5	3	-----	11	6	17	14	23
Total	1,429	130,300,224	296	214	2,423	252	2,111	597	335	142	2,353	832	3,185	146	2,330

TABLE 31.—Bituminous coal and lignite strip mines using power drills in bank or overburden in the United States

Year	Number of mines	Production		Number of power drills		
		Quantity (net tons)	Percentage of total	Horizontal	Vertical	Total
1946	514	75,375,841	66.7	(1)	(1)	764
1947	598	95,915,346	68.8	(1)	(1)	875
1948	728	98,809,393	72.3	(1)	(1)	1,195
1949	756	78,146,655	73.7	(1)	(1)	1,256
1950	692	87,205,280	70.6	(1)	(1)	1,201
1951	650	85,331,204	72.5	737	388	1,125
1952	629	79,252,284	73.0	685	385	1,070
1953	603	80,259,365	76.1	639	409	1,048
1954	541	70,107,205	71.4	592	391	983
1955	564	85,623,050	74.4	582	371	953
1956	696	96,278,779	75.8	652	389	1,041
1957	722	96,418,089	77.7	640	464	1,104
1958	737	91,659,662	78.9	615	464	1,079
1959	697	95,716,153	79.1	580	487	1,067
1960	714	96,660,466	78.8	551	498	1,049
1961	650	92,135,940	75.5	495	449	944
1962	636	100,901,554	77.4	456	461	917

(1) Data not available.

TABLE 32.—Bituminous coal and lignite strip mines using power drills in bank or overburden in the United States, by States

State	Number of mines		Production				Number of power drills					
			Quantity (net tons)		Percentage of total strip production		Horizontal		Vertical		Total	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	26	21	1, 789, 289	1, 863, 186	66. 2	67. 2	12	9	23	19	35	28
Alaska	4	5	627, 537	761, 566	100. 0	100. 0	2	3	10	9	12	12
Arkansas	7	6	222, 173	164, 277	96. 5	98. 9	6	5	2	1	8	6
Colorado	4	4	487, 745	518, 762	93. 6	92. 5	3	2	5	5	8	7
Illinois	42	40	19, 367, 844	20, 565, 677	85. 0	83. 7	29	29	38	28	67	57
Indiana	30	28	10, 375, 741	11, 198, 453	98. 8	99. 0	21	20	18	19	39	39
Iowa	26	22	779, 600	965, 882	100. 0	100. 0	25	21	13	11	38	32
Kansas	6	6	654, 455	904, 748	98. 9	99. 1	8	10	1	--------	9	10
Kentucky:												
Eastern	19	22	1, 048, 468	1, 192, 599	41. 0	54. 0	16	16	8	9	24	25
Western	27	25	17, 422, 158	18, 542, 214	92. 2	91. 6	18	16	34	34	52	50
Total Kentucky	46	47	18, 470, 626	19, 734, 813	86. 1	88. 0	34	32	42	43	76	75
Maryland	6	4	47, 350	221, 120	10. 1	47. 2	1	1	2	3	3	4
Missouri	13	11	2, 247, 324	2, 279, 778	78. 4	80. 3	18	13	3	1	21	14
Montana:												
Bituminous	2	1	7, 660	3, 000	100. 0	100. 0	1	1	1	--------	2	1
Lignite	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Total Montana	2	1	7, 660	3, 000	100. 0	100. 0	1	1	1	--------	2	1
New Mexico	1	1	15, 248	395, 065	100. 0	99. 3	--------	--------	1	1	1	1
North Dakota (lignite)	5	5	216, 517	897, 925	7. 9	32. 9	3	4	4	3	7	7
Ohio	114	118	16, 712, 213	18, 196, 438	74. 4	77. 6	81	78	91	98	172	176
Oklahoma	15	10	849, 444	865, 941	96. 2	97. 4	11	9	7	7	18	16
Pennsylvania	169	182	10, 656, 117	11, 753, 791	51. 4	52. 9	117	114	120	138	237	252
Tennessee	21	23	774, 235	1, 302, 986	44. 0	57. 3	21	21	6	9	27	30
Virginia	15	14	1, 039, 182	1, 144, 528	73. 6	63. 9	15	11	4	6	19	17
Washington	1	1	6, 382	2, 115	100. 0	100. 0	--------	--------	1	--------	1	--------
West Virginia	89	79	4, 579, 747	4, 839, 610	78. 2	79. 0	78	67	53	51	131	118
Wyoming	8	8	2, 209, 511	2, 321, 893	99. 3	99. 2	9	6	4	9	13	15
Total	65	636	92, 135, 940	100, 901, 554	75. 5	77. 4	495	456	449	461	944	917

TABLE 33.—Method of haulage from bituminous coal and lignite strip mines to tipple or ramp, in the United States [1]

Year	Strip mines reporting method of haulage							Strip mines not reporting method of haulage—production (net tons)	Total strip production (net tons)
	Strip mines using trucks				Strip mines using rail, rail and truck, truck and tram—production (net tons)	Strip production			
	Production (net tons)	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)		Total (net tons)	Percentage of total		
1948	97, 450, 399	7, 214	9. 4	3. 7	6, 327, 989	103, 778, 388	74. 4	35, 727, 532	139, 505, 920
1949	73, 229, 556	6, 694	10. 1	3. 7	5, 365, 432	78, 594, 988	74. 1	27, 450, 311	106, 045, 299
1950	88, 666, 733	6, 564	10. 3	3. 8	4, 364, 333	93, 031, 066	75. 3	30, 435, 498	123, 466, 564
1951	87, 427, 029	6, 173	10. 6	4. 0	2, 424, 994	89, 852, 023	76. 4	27, 765, 653	117, 617, 676
1952	88, 589, 637	5, 799	11. 3	4. 0	2, 296, 744	90, 886, 381	83. 5	18, 023, 375	108, 909, 756
1953	84, 764, 694	5, 287	12. 2	4. 0	2, 104, 609	86, 869, 303	82. 4	18, 579, 266	105, 448, 569
1954	73, 794, 489	4, 250	13. 2	3. 9	1, 203, 753	74, 998, 242	76. 4	23, 136, 008	98, 134, 250
1955	94, 150, 171	4, 798	13. 3	3. 9	2, 290, 600	96, 440, 771	83. 9	18, 651, 998	115, 092, 769
1956	103, 127, 374	5, 432	13. 3	4. 4	1, 056, 627	104, 184, 001	82. 0	22, 871, 381	127, 055, 382
1957	104, 796, 728	5, 532	14. 0	4. 3	164, 311	104, 961, 039	84. 6	19, 147, 499	124, 108, 538
1958	99, 223, 676	5, 151	14. 5	4. 4	19, 241	99, 242, 917	85. 4	16, 998, 870	116, 241, 787
1959	102, 706, 819	4, 959	15. 3	4. 6	----------------	102, 706, 819	84. 9	18, 246, 515	120, 953, 334
1960	104, 099, 974	4, 855	15. 5	4. 8	----------------	104, 099, 974	84. 9	18, 529, 690	122, 629, 664
1961	101, 951, 989	4, 407	16. 5	4. 4	----------------	101, 951, 989	83. 6	20, 027, 095	121, 979, 084
1962	109, 846, 339	4, 309	17. 7	4. 9	----------------	109, 846, 339	84. 3	20, 453, 885	130, 300, 224

---

[1] Excludes lignite in 1948 and 1949.

TABLE 34.—Method of haulage from bituminous coal and lignite strip mines to tipple or ramp, in the United States, 1962, by States

State	Strip mines reporting method of haulage					Strip mines not reporting method of haulage, production (net tons)	Total strip production (net tons)
	Number of trucks	Average capacity per truck (net tons)	Average distance hauled (miles)	Production			
				Net tons	Percentage of total production		
Alabama	95	19.0	4.7	1,976,571	71.3	797,382	2,773,953
Alaska	23	20.6	2.3	761,566	100.0	------------	761,566
Arkansas	21	9.0	2.1	164,277	98.9	1,850	166,127
Colorado	20	19.5	2.9	526,142	93.9	34,441	560,583
Illinois	360	31.6	4.0	24,545,380	99.8	39,671	24,585,051
Indiana	139	31.9	4.5	11,165,703	98.7	143,228	11,308,931
Iowa	57	11.9	4.1	954,047	98.8	11,835	965,882
Kansas	26	31.6	2.8	906,157	99.3	6,653	912,810
Kentucky	338	22.0	4.0	18,094,930	80.6	4,343,397	22,438,327
Maryland	39	14.9	10.3	323,204	69.0	145,401	468,605
Missouri	73	27.9	3.9	2,308,768	81.3	530,780	2,839,548
Montana:							
Bituminous	1	7.0	.3	3,000	100.0	------------	3,000
Lignite	5	13.6	1.0	296,466	100.0	------------	296,466
Total Montana	6	12.5	1.0	299,466	100.0	------------	299,466
New Mexico	7	24.6	1.8	397,915	100.0	------------	397,915
North Dakota (lignite)	81	15.0	2.9	2,596,688	95.1	134,107	2,730,795
Ohio	724	17.8	6.2	18,576,279	79.2	4,865,501	23,441,780
Oklahoma	90	12.2	6.8	806,293	90.7	82,850	889,143
Pennsylvania	1,477	13.0	5.9	15,958,472	71.9	6,248,703	22,207,175
South Dakota (lignite)	3	6.0	.5	17,914	100.0	------------	17,914
Tennessee	134	14.1	9.1	1,043,702	45.9	1,231,531	2,275,233
Virginia	75	13.0	4.2	1,160,608	64.7	631,865	1,792,473
Washington	2	10.0	2.0	2,115	100.0	------------	2,115
West Virginia	487	15.4	6.8	4,926,995	80.4	1,198,004	6,124,999
Wyoming	32	32.8	6.3	2,333,147	99.7	6,686	2,339,833
Total	4,309	17.7	4.9	109,846,339	84.3	20,453,885	130,300,224

TABLE 35.—Stripping operations in the bituminous coal and lignite fields of the United States, 1962, by States and counties

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Alabama:						
Bibb	2	26,893	20	68	1,383	19.45
Blount	3	128,196	33	298	9,953	12.88
Cullman	1	4,450	6	100	636	7.00
Jefferson	7	334,021	92	215	19,823	16.85
Marion	2	64,545	43	100	4,303	15.00
Tuscaloosa	7	622,858	193	190	36,617	17.01
Walker	19	1,464,467	270	180	48,653	30.10
Winston	1	128,523	32	200	6,426	20.00
Total Alabama	42	2,773,953	689	185	127,794	21.71
Alaska	5	761,566	136	304	41,434	18.38
Arkansas:						
Franklin	1	87,180	17	242	4,106	21.23
Johnson	3	44,529	33	120	3,930	11.33
Pope	(1)	(1)	(1)	(1)	(1)	(1)
Sebastian	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	3	34,418	46	97	4,444	7.74
Total Arkansas	7	166,127	96	130	12,480	13.31
Colorado:						
El Paso	1	2,286	2	140	280	8.16
Fremont	3	40,612	10	146	1,496	27.14
Moffat	(1)	(1)	(1)	(1)	(1)	(1)
Montrose	(1)	(1)	(1)	(1)	(1)	(1)
Routt	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	4	517,685	100	199	19,869	26.05
Total Colorado	8	560,583	112	193	21,645	25.90
Illinois:						
Adams	1	42,904	16	159	2,540	16.89
Bureau	(1)	(1)	(1)	(1)	(1)	(1)
Fulton	16	5,128,403	756	251	189,871	27.01
Greene	1	4,508	2	240	480	9.39
Grundy	(1)	(1)	(1)	(1)	(1)	(1)
Jackson	(1)	(1)	(1)	(1)	(1)	(1)
Jefferson	1	18,481	7	230	1,610	11.48
Kankakee	(1)	(1)	(1)	(1)	(1)	(1)
Knox	(1)	(1)	(1)	(1)	(1)	(1)
Mercer	1	3,700	2	205	409	9.05
Peoria	7	1,032,783	101	267	27,057	38.17
Perry	(1)	(1)	(1)	(1)	(1)	(1)
Randolph	2	1,066,779	99	301	29,832	35.76
St. Clair	3	3,678,459	268	299	80,228	45.85
Saline	8	2,097,741	413	247	102,080	20.55
Schuyler	(1)	(1)	(1)	(1)	(1)	(1)
Stark	(1)	(1)	(1)	(1)	(1)	(1)
Vermilion	(1)	(1)	(1)	(1)	(1)	(1)
Wabash	1	2,583	2	155	310	8.33
Will	(1)	(1)	(1)	(1)	(1)	(1)
Williamson	7	2,003,323	280	263	73.706	27.18
Other counties	15	9,505,387	1,085	265	287,496	33.06
Total Illinois	63	24,585,051	3,031	262	795,619	30.90
Indiana:						
Clay	8	1,188.319	171	256	43,833	27.11
Daviess	1	44,457	16	185	2,960	15.02
Fountain	(1)	(1)	(1)	(1)	(1)	(1)
Greene	6	1,624,522	211	262	55,256	29.40
Owen	(1)	(1)	(1)	(1)	(1)	(1)
Parke	(1)	(1)	(1)	(1)	(1)	(1)
Pike	3	1,614,322	212	287	60,872	26.52
Spencer	(1)	(1)	(1)	(1)	(1)	(1)
Sullivan	1	10,825	8	193	1,487	7.28
Vigo	(1)	(1)	(1)	(1)	(1)	(1)
Warrick	9	5,805,194	441	247	109,018	53.25
Other counties	10	1,021,292	187	219	40,955	24.94
Total Indiana	38	11,308,931	1,246	252	314,381	35.97

[1] Included in "Other counties" to avoid disclosing individual operations.

TABLE 35.—Stripping operations in the bituminous coal and lignite fields of the United States, 1962, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Iowa:						
Lucas	1	1,124	2	40	83	13.61
Mahaska	7	285,029	74	272	20,101	14.18
Marion	9	580,210	119	197	23,481	24.71
Monroe	2	23,982	11	142	1,559	15.38
Van Buren	1	18,433	8	180	1,440	12.80
Wapello	2	57,104	16	257	4,105	13.91
Total Iowa	22	965,882	230	221	50,769	19.03
Kansas:						
Bourbon	1	2,339	3	150	450	5.20
Cherokee	(1)	(1)	(1)	(1)	(1)	(1)
Coffey	1	1,621	2	150	300	5.40
Crawford	(1)	(1)	(1)	(1)	(1)	(1)
Osage	1	1,050	6	60	354	2.97
Other counties	7	907,800	214	236	50,575	17.95
Total Kansas	10	912,810	225	230	51,679	17.66
Kentucky, Eastern:						
Bell	12	432,697	79	147	11,654	37.13
Boyd	1	32,492	22	100	2,166	15.00
Breathitt	1	45,000	30	100	3,000	15.00
Clay	2	37,307	13	104	1,315	28.38
Elliott	1	2,408	2	100	241	10.00
Harlan	6	121,412	34	124	4,208	28.85
Jackson	1	15,000	8	180	1,440	10.42
Knott	4	273,760	52	150	7,822	35.00
Knox	1	67,620	20	233	4,651	14.54
Laurel	4	64,953	31	76	2,368	27.43
Lawrence	1	6,080	12	50	608	10.00
Letcher	2	224,953	44	189	8,237	27.31
McCreary	1	49,886	20	131	2,620	19.04
Morgan	1	39,611	7	141	990	40.00
Perry	5	102,000	41	100	4,080	25.00
Pike	5	252,565	42	150	6,314	40.00
Pulaski	3	67,800	11	269	2,959	22.91
Rockcastle	1	8,000	16	100	1,600	5.00
Whitley	5	363,035	35	232	8,134	44.63
Total Eastern Kentucky	57	2,206,579	519	143	74,407	29.66
Kentucky, Western:						
Butler	4	144,826	21	172	3,550	40.80
Christian	1	69,799	18	282	5,076	13.75
Daviess	2	1,021,983	78	294	22,945	44.54
Grayson	1	1,600	3	50	160	10.00
Hancock	1	3,205	3	100	321	10.00
Hopkins	9	3,725,017	332	254	84,391	44.14
McLean	1	73,638	37	100	3,682	20.00
Muhlenberg	13	11,839,226	823	287	236,265	50.11
Ohio	7	2,759,153	199	306	60,761	45.41
Webster	4	593,301	61	273	16,675	35.58
Total Western Kentucky	43	20,231,748	1,575	275	433,826	46.64
Total Kentucky	100	22,438,327	2,094	243	508,233	44.15
Maryland:						
Allegany	13	94,707	62	162	10,086	9.39
Garrett	16	373,898	96	181	17,350	21.55
Total Maryland	29	468,605	158	174	27,436	17.08
Missouri:						
Barton	(1)	(1)	(1)	(1)	(1)	(1)
Boone	(1)	(1)	(1)	(1)	(1)	(1)
Calloway	(1)	(1)	(1)	(1)	(1)	(1)
Clark	1	12,453	7	199	1,391	8.95
Dade	1	18,000	10	285	2,848	6.32
Henry	(1)	(1)	(1)	(1)	(1)	(1)

[1] Included in "Other counties" to avoid disclosing individual operations.

TABLE 35.—Stripping operations in the bituminous coal and lignite fields of the United States, 1962, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Missouri—Continued						
Macon	(1)	(1)	(1)	(1)	(1)	(1)
Putnam	(1)	(1)	(1)	(1)	(1)	(1)
Randolph	(1)	(1)	(1)	(1)	(1)	(1)
St. Clair	(1)	(1)	(1)	(1)	(1)	(1)
Vernon	4	56,348	26	162	4,205	13.40
Other counties	13	2,752,747	465	255	118,490	23.23
Total Missouri	19	2,839,548	508	250	126,934	22.37
Montana (bituminous): Rosebud	1	3,000	4	79	318	9.44
Montana (lignite):						
Richland	(1)	(1)	(1)	(1)	(1)	(1)
Sheridan	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	2	296,466	21	197	4,141	71.59
Total Montana (lignite)	2	296,466	21	197	4,141	71.59
Total Montana	3	299,466	25	178	4,459	67.16
New Mexico: McKinley [2]	3	400,030	39	213	8,321	48.07
North Dakota (lignite):						
Adams	1	20,846	6	180	1,080	19.30
Bowman	(1)	(1)	(1)	(1)	(1)	(1)
Burke	(1)	(1)	(1)	(1)	(1)	(1)
Burleigh	1	10,734	1	140	140	76.67
Divide	(1)	(1)	(1)	(1)	(1)	(1)
Dunn	1	3,959	6	91	548	7.22
Grant	4	23,841	8	89	709	33.62
Hettinger	1	2,580	2	86	171	15.13
McLean	3	84,568	18	171	3,079	27.47
Mercer	4	1,042,475	91	206	18,706	55.73
Morton	3	18,674	9	125	1,129	16.54
Mountrail	(1)	(1)	(1)	(1)	(1)	(1)
Oliver	3	11,612	8	95	763	15.22
Stark	(1)	(1)	(1)	(1)	(1)	(1)
Ward	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	11	1,511,506	163	236	38,453	39.31
Total North Dakota (lignite)	32	2,730,795	312	208	64,778	42.16
Ohio:						
Athens	(1)	(1)	(1)	(1)	(1)	(1)
Belmont	21	2,586,164	492	221	108,662	23.80
Carroll	11	276,002	63	252	15,917	17.34
Columbiana	30	1,069,745	216	274	59,167	18.08
Coshocton	10	1,383,569	224	256	57,338	24.13
Gallia	5	578,182	137	251	34,395	16.81
Guernsey	5	233,784	65	249	16,145	14.48
Harrison	11	4,683,549	418	238	99,417	47.11
Hocking	3	55,386	25	122	3,012	18.39
Holmes	4	240,361	35	242	8,360	28.75
Jackson	11	249,513	77	262	20,187	12.36
Jefferson	35	2,346,654	523	231	120,837	19.42
Lawrence	5	383,173	58	248	14,400	26.61
Mahoning	19	1,049,815	238	258	61,285	17.13
Meigs	6	141,279	52	173	9,022	15.66
Morgan	4	2,222,705	246	244	59,992	37.05
Muskingum	5	197.677	30	190	5.666	34.89
Noble	8	1,154,351	122	209	25,505	45.26
Perry	(1)	(1)	(1)	(1)	(1)	(1)
Portage	1	94,950	22	321	7,065	13.44
Stark	19	658.366	155	281	43,629	15.09
Tuscarawas	31	1,745,695	464	263	122.077	14.30
Vinton	5	54,813	46	139	6,433	8.52
Washington	(1)	(1)	(1)	(1)	(1)	(1)
Wayne	2	50,619	27	234	6,319	8.01
Other counties	15	1,985,428	271	261	70,805	28.04
Total Ohio	266	23,441,780	4,006	244	975,635	24.03

See footnotes at end of table.

TABLE 35.—Stripping operations in the bituminous coal and lignite fields of the United States, 1962, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
Oklahoma:						
Craig	5	264,486	81	252	20.376	12.98
Haskell	4	372,188	106	164	17,368	21.43
McIntosh	(1)	(1)	(1)	(1)	(1)	(1)
Rogers	(1)	(1)	(1)	(1)	(1)	(1)
Sequoyah	1	16.898	13	23	304	55.58
Other counties	2	235.571	55	219	12,072	19.51
Total Oklahoma	12	889,143	255	197	50,120	17.74
Pennsylvania:						
Allegheny	20	563.780	234	134	31,373	17.97
Armstrong	49	1,490,164	345	174	59.966	24.85
Beaver	16	587,065	134	252	33.798	17.37
Bedford	(1)	(1)	(1)	(1)	(1)	(1)
Blair	1	71,665	24	304	7,373	9.72
Bradford	(1)	(1)	(1)	(1)	(1)	(1)
Butler	34	1,844,568	313	256	80,164	23.01
Cambria	19	404,713	211	163	34,473	11.74
Cameron	(1)	(1)	(1)	(1)	(1)	(1)
Centre	16	697,404	226	260	58,753	11.87
Clarion	35	3,413,979	679	274	185,947	18.36
Clearfield	104	5,468.457	1,473	232	341,779	16.00
Clinton	6	404,687	77	265	20,439	19.80
Elk	8	305.389	78	216	16,844	18.13
Fayette	24	417,552	133	163	21,680	19.26
Greene	7	41,046	25	107	2,624	15.64
Huntingdon	(1)	(1)	(1)	(1)	(1)	(1)
Indiana	30	638,721	205	186	38,087	16.77
Jefferson	27	955,470	273	217	59,199	16.14
Lawrence	21	603,600	228	189	43,053	14.02
Lycoming	(1)	(1)	(1)	(1)	(1)	(1)
Mercer	11	1,119,718	171	308	52,569	21.30
Somerset	35	1,197.339	283	197	55,664	21.51
Tioga	5	304,055	67	246	16.453	18.48
Venango	6	295.371	69	192	13,216	22.35
Washington	18	893.036	226	207	46,682	19.13
Westmoreland	24	160,969	91	156	14,170	11.36
Other counties	10	328.427	82	212	17,349	18.93
Total Pennsylvania	526	22,207,175	5,647	222	1,251,655	17.74
South Dakota (lignite): Dewey	1	17,914	8	189	1,513	11.84
Tennessee:						
Anderson	6	418.000	47	216	10,104	41.37
Campbell	17	837,887	160	197	31,440	26.65
Claiborne	5	215.530	32	161	5,172	41.67
Grundy	2	174,662	28	257	7,191	24.29
Hamilton	1	15,595	16	141	2,260	6.90
Marion	2	59.592	12	252	3,091	19.28
Morgan	5	109.847	21	178	3,772	29.12
Pickett	1	4,000	8	50	400	10.00
Scott	10	257,180	56	140	7.791	33.01
Van Buren	5	182,940	51	131	6,726	27.20
Total Tennessee	54	2.275,233	431	181	77,947	29.19
Virginia:						
Buchanan	6	134.806	45	150	6,740	20.00
Dickenson	8	483,749	48	173	8.339	58.01
Lee	(1)	(1)	(1)	(1)	(1)	(1)
Russell	6	107.510	26	197	5,181	20.75
Tazewell	(1)	(1)	(1)	(1)	(1)	(1)
Wise	20	1,002,706	142	221	31,453	31.88
Other counties	4	63.702	11	189	2.083	30.58
Total Virginia	44	1,792.473	272	198	53,796	33.32
Washington: Kittitas	(2)	(2)	(2)	(2)	(2)	(2)

See footnotes at end of table.

TABLE 35.—Stripping operations in the bituminous coal and lignite fields of the United States, 1962, by States and counties—Continued

State and county	Number of strip mines	Production (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
West Virginia:						
Barbour	8	619, 004	144	179	25, 706	24. 08
Boone	1	302, 881	67	230	15, 429	19. 63
Brooke	6	310, 405	82	180	14, 718	21. 09
Fayette	(1)	(1)	(1)	(1)	(1)	(1)
Gilmer	2	3, 413	4	133	532	6. 42
Grant	(1)	(1)	(1)	(1)	(1)	(1)
Greenbrier	3	38, 339	22	98	2, 158	17. 77
Harrison	23	1, 355, 497	294	176	51, 717	26. 21
Kanawha	7	335, 410	67	127	8, 506	39. 43
Lewis	4	232, 162	84	190	16, 044	14. 47
Lincoln	4	32, 900	21	78	1, 648	19. 96
Logan	(1)	(1)	(1)	(1)	(1)	(1)
Marion	2	36, 463	17	86	1, 432	25. 46
Mason	3	95, 458	27	148	3, 997	23. 88
McDowell	7	471, 142	101	169	17, 083	27. 58
Mercer	4	152, 416	41	160	6, 578	23. 17
Monongalia	3	73, 450	13	212	2, 753	26. 68
Nicholas	5	132, 625	32	164	5, 242	25. 30
Pocahontas	(1)	(1)	(1)	(1)	(1)	(1)
Preston	19	729, 339	132	259	34, 145	21. 36
Putnam	(1)	(1)	(1)	(1)	(1)	(1)
Raleigh	6	257, 803	75	141	10, 640	24. 23
Randolph	5	41, 376	15	121	1, 868	22. 15
Taylor	3	284, 460	41	71	2, 920	97. 42
Tucker	(1)	(1)	(1)	(1)	(1)	(1)
Upshur	5	99, 691	20	101	2, 069	48. 19
Webster	(1)	(1)	(1)	(1)	(1)	(1)
Wyoming	5	55, 491	38	71	2, 689	20. 64
Other counties	10	465, 274	110	177	19, 484	23. 88
Total West Virginia	135	6, 124, 999	1, 447	171	247, 358	24. 76
Wyoming:						
Campbell	1	482, 781	34	262	8, 919	54. 13
Carbon	3	462, 866	61	258	15, 733	29. 42
Converse	(1)	(1)	(1)	(1)	(1)	(1)
Lincoln	(1)	(1)	(1)	(1)	(1)	(1)
Sheridan	2	356, 636	36	246	8, 867	40. 22
Other counties	4	1, 037, 550	83	254	21, 098	49. 18
Total Wyoming	10	2, 339, 833	214	255	54, 617	42. 84
Total United States	1, 429	130, 300, 224	21, 181	230	4, 868, 603	26. 76

[1] Included in "Other counties" to avoid disclosing individual operations.
[2] To avoid disclosing individual operations New Mexico and Washington are combined.

AUGER MINING

Augers are generally used in areas where strip mining has become economically impracticable because the overburden is thick. They were used first about 1945, and separate statistics on coal-recovery augers begin with 1951. The rapidly expanded production of coal by stripping during World War II in the mountainous areas of the northern Appalachian region left many miles of high wall containing exposed coal seams. After several years of experimentation, large, efficient augers as much as 84 inches in diameter were developed to recover the coal from these exposed coal seams.

Production at auger mines increased rapidly from 205,000 tons in 1951 to 11 million tons in 1962. Augers were used to mine coal in seven States in 1962, and sales of augers reported by three manufacturers indicate continued growth of auger mining. A few coal-recovery augers have been sold for underground use; these units and the coal produced by them have been included with coal loaded mechanically underground.

TABLE 36.—Auger mines in the bituminous coal and lignite fields of the United States, 1962, by States and counties

State and county	Number of auger mines	Augers	Equipment in use (number of units)			Mined by augers (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
			Power shovels	Power drills	Bulldozers					
Alabama:										
Tuscaloosa	1	1	------	------	------	43,200	11	66	733	58.97
Walker	3	3	------	------	------	72,429	15	176	2,610	27.75
Total Alabama	4	4	------	------	------	115,629	26	129	3,343	34.59
Kentucky, Eastern:										
Bell	15	16	8	2	11	566,007	129	60	7,734	73.18
Clay	2	2	------	------	2	37,848	9	143	1,284	29.48
Floyd	3	3	------	------	1	48,991	17	115	1,988	24.64
Harlan	13	13	------	------	20	339,993	86	93	7,959	42.72
Knott	4	4	------	------	7	418,000	139	100	13,933	30.00
Knox	1	2	------	------	------	67,257	3	200	600	112.10
Laurel	1	1	------	------	------	25,999	13	100	1,300	20.00
Letcher	14	15	2	------	10	506,512	110	166	18,259	27.74
Perry	13	13	5	------	17	713,308	406	115	46,713	15.27
Pike	34	35	2	3	10	838,650	308	79	24,295	34.52
Whitley	2	3	------	1	------	166,307	11	176	1,907	87.19
Total Eastern Kentucky	102	107	17	6	78	3,728,872	1,231	102	125,972	29.60
Kentucky, Western:										
Hopkins	1	1	------	------	------	5,000	5	50	250	20.00
Ohio	1	1	1	------	2	164,133	16	200	3,283	50.00
Webster	1	1	------	------	1	7,596	4	50	190	40.00
Total Western Kentucky	3	3	1	------	3	176,729	25	149	3,723	47.47
Total Kentucky	105	110	18	6	81	3,905,601	1,256	103	129,695	30.11
Ohio:										
Athens	1	1	------	------	1	4,259	3	73	219	19.45
Belmont	3	3	1	1	2	24,894	10	123	1,235	20.16
Carroll	2	2	------	------	1	5,129	3	60	182	28.17
Columbiana	5	3	------	------	2	38,828	9	159	1,438	27.01
Coshocton	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Gallia	3	2	------	------	2	76,912	7	242	1,685	45.64
Guernsey	2	1	------	------	------	20,637	5	56	282	73.18
Harrison	5	3	------	------	4	175,446	21	109	2,322	75.55
Hocking	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Jefferson	7	7	------	------	4	209,005	20	170	3,398	61.50
Meigs	5	5	------	------	3	60,672	17	102	1,743	34.81
Noble	6	7	1	------	6	256,234	44	122	5,383	47.60
Perry	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tuscarawas	7	7	------	------	5	109,643	28	219	6,191	17.71
Washington	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	7	7	1	------	7	367,226	65	145	9,441	38.90
Total Ohio	53	48	3	1	37	1,348,885	232	144	33,519	40.24
Pennsylvania:										
Allegheny	1	1	------	------	------	10,752	2	114	228	47.16
Armstrong	9	9	------	4	1	98,159	28	119	3,322	29.55
Beaver	3	3	------	1	------	42,047	7	188	1,319	31.88
Butler	8	8	------	1	1	128,122	36	97	3,515	36.45
Cambria	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Clarion	7	7	------	------	1	49,269	23	73	1,715	28.72
Clearfield	10	12	------	------	3	124,449	32	163	5,287	23.54
Elk	1	2	------	------	------	25,314	5	229	1,174	21.57
Indiana	2	2	------	------	------	8,864	3	88	220	40.21
Jefferson	5	6	------	------	1	21,327	14	94	1,282	16.64
Lawrence	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Somerset	1	1	------	------	------	2,217	3	50	148	15.00
Washington	2	2	------	------	1	33,486	9	124	1,152	29.08

[1] Included in "Other counties" to avoid disclosing individual operations.

TABLE 36.—Auger mines in the bituminous coal and lignite fields of the United States, 1962, by States and counties—Continued

State and county	Number of auger mines	Augers	Equipment in use (number of units)			Mined by augers (net tons)	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day
			Power shovels	Power drills	Bulldozers					
Pennsylvania—Con.										
Westmoreland	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	7	7			2	83,492	20	153	3,069	27.20
Total Pennsylvania	56	60		6	10	627,498	182	123	22,431	27.97
Tennessee:										
Anderson	3	2			1	54,444	7	206	1,414	38.50
Campbell	4	4	4		3	54,965	44	50	2,195	25.04
Claiborne	2	2	1		2	75,566	19	135	2,550	29.63
Scott	1	1			1	32,685	4	201	804	40.65
Total Tennessee	10	9	5		7	217,660	74	94	6,963	31.26
Virginia:										
Buchanan	12	12		1	14	233,897	50	182	9,046	36.91
Dickenson	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Lee	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Russell	3	4			2	48,156	5	224	1,140	42.26
Tazewell	4	4	1		5	136,390	17	187	3,181	42.88
Wise	10	11		1	10	292,177	41	188	7,762	37.64
Other counties	4	4			4	243,020	34	184	6,254	38.86
Total Virginia	33	35	1	2	35	953,640	147	186	27,383	34.83
West Virginia:										
Barbour	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Boone	9	10	4		13	469,877	85	140	11,899	39.49
Brooke	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Clay	1	1	1		2	46,229	14	185	2,590	17.85
Fayette	6	7			5	101,507	18	160	2,806	36.17
Gilmer	3	2			2	44,970	9	133	1,200	37.48
Greenbrier	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Harrison	7	9			4	295,323	61	140	8,590	34.48
Kanawha	12	12	2		15	1,248,643	131	201	26,320	47.44
Lewis	4	4			4	51,931	15	94	1,419	36.60
Logan	9	10			11	281,122	76	81	6,184	45.46
Mason	1	1				8,037	2	134	268	29.99
McDowell	7	8			5	153,779	28	97	2,703	56.89
Mercer	8	6			1	14,220	18	42	753	18.89
Mineral	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mingo	9	4	2		3	221,485	34	96	3,268	67.77
Monongalia	2	2				17,125	10	44	435	39.37
Nicholas	6	8		2	5	194,193	37	169	6,250	31.07
Pocahontas	1	1			2	6,134	4	149	596	10.29
Preston	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Raleigh	5	6			3	22,364	32	33	1,040	21.50
Randolph	2	2			1	7,548	8	80	639	11.81
Wyoming	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other counties	12	12	2		11	229,333	58	94	5,469	41.93
Total West Virginia	104	105	11	2	87	3,413,820	640	129	82,429	41.42
Total United States	365	371	38	17	257	10,582,733	2,557	120	305,763	34.61

[1] Included in "Other counties" to avoid disclosing individual operations.

TABLE 37.—Units of coal-recovery augers sold to bituminous coal and lignite mines for surface use in the United States, as reported by manufacturers, by States

	1958	1959	1960	1961	1962
Alabama	1	1	----------	1	1
Illinois	----------	1	----------	----------	----------
Iowa	----------	----------	----------	----------	1
Kentucky	13	21	8	5	4
Ohio	4	7	5	5	2
Pennsylvania	6	7	7	4	4
Tennessee	5	2	1	1	----------
Virginia	4	1	1	----------	1
West Virginia	9	7	3	2	2
Total	42	47	25	18	15

MECHANICAL LOADING

Prior to 1925 less than 1 percent of the total underground output was mechanically loaded. During the next 10 years (1925–35), as better machines were developed, mechanical loading increased more than 1 percent per year, and in 1935 almost 14 percent of the total underground output was mechanically loaded. Development was rapid in some States and practically nothing in others. The percentage of underground production mechanically loaded in 1935 in certain States was as follows: Wyoming (90), Illinois (56), Indiana (64), Pennsylvania (7), West Virginia (2), and Kentucky (1). During the next 20 years (1935–55), mechanical loading increased rapidly, averaging a gain of more than 3 percent per year until it included 85 percent of the underground output in 1955.

Although the increase in mechanical loading has leveled off in the past few years, the type of loading equipment has changed considerably. In the past 10 years the proportion produced by mobile loading into mine cars decreased from 28 to 2 percent of the total mechanically loaded, and mobile loading into shuttle cars increased from 49 to 56 percent; production from continuous-mining machines increased from 3 to 37 percent, and all other types of mechanical loading decreased from 20 to 5 percent.

The most important change in mechanical loading in recent years was the introduction of continuous-mining machines. In 1962, 90 million tons of bituminous coal was produced at 297 mines by continuous-mining machines, compared with 84 million tons in 1961 from 249 mines. In 1962, 150 mines, compared with 100 in 1961, used continuous-mining machines exclusively.

Sales of mobile loading machines, continuous-mining machines, gathering and haulage conveyors and bridge conveyors increased, while sales of shuttle cars and room or transfer conveyors decreased.

TABLE 38.—Growth of mechanical loading at underground bituminous coal and lignite mines in the United States

Year	Underground production (thousand net tons)							Percentage of underground production		Number of mechanical loading units				
	Mechanically loaded					Hand-loaded into mine cars	Total	Mechanically loaded	Hand-loaded into mine cars	Mobile loading machines used in conventional mining	Duckbills and scrapers[1]	Hand-loaded conveyors and pit-car loaders[1]	Continuous mining machines	Mobile loading machines used in conjunction with continuous mining
	Conventional mining			Continuous mining	Total									
	Mobile loading machines	Duckbills and scrapers[1]	Hand-loaded conveyors and pit-car loaders[1]											
1923	(2)	(2)	(2)	----------	[3] 1,880	550,745	552,625	0.3	99.7	(2)	(2)	(2)	----------	----------
1924	(2)	(2)	(2)	----------	[3] 3,496	466,584	470,080	.7	99.3	(2)	(2)	(2)	----------	----------
1925	(2)	(2)	(2)	----------	[3] 6,243	496,939	503,182	1.2	98.8	(2)	(2)	(2)	----------	----------
1926	7,786	2,236	523	----------	[3] 10,545	545,899	556,444	1.9	98.1	295	160	(2)	----------	----------
1927	(2)	(2)	(2)	----------	16,500	482,885	499,385	3.3	96.7	(2)	(2)	(2)	----------	----------
1928	11,811	2,748	7,000	----------	21,559	459,397	480,956	4.5	95.5	397	212	1,040	----------	----------
1929	16,432	2,859	18,571	----------	37,862	476,859	514,721	7.4	92.6	488	225	2,521	----------	----------
1930	20,073	3,265	23,644	----------	46,982	400,702	447,684	10.5	89.5	545	290	2,876	----------	----------
1931	19,407	3,282	24,873	----------	47,562	315,595	363,157	13.1	86.9	583	311	3,428	----------	----------
1932	14,825	2,762	18,230	----------	35,817	254,252	290,069	12.3	87.7	548	287	3,112	----------	----------
1933	17,865	2,647	17,309	----------	37,821	277,539	315,360	12.0	88.0	523	225	2,978	----------	----------
1934	20,750	3,086	17,597	----------	41,433	297,145	338,578	12.2	87.8	534	276	2,862	----------	----------
1935	24,675	3,713	18,789	----------	47,177	301,549	348,726	13.5	86.5	657	257	2,768	----------	----------
1936	40,970	4,513	21,494	----------	66,977	343,985	410,962	16.3	83.7	980	340	2,787	----------	----------
1937	(2)	(2)	(2)	----------	83,500	330,280	413,780	20.2	79.8	(2)	(2)	(2)	----------	----------
1938	57,824	5,279	21,990	----------	85,093	233,045	318,138	26.7	73.3	1,405	463	2,918	----------	----------
1939	76,442	7,766	26,504	----------	110,712	246,421	357,133	31.0	69.0	1,573	690	2,707	----------	----------
1940	100,962	11,617	35,291	----------	147,870	269,734	417,604	35.4	64.6	1,720	772	2,960	----------	----------
1941	126,478	16,208	43,981	----------	186,667	272,411	459,078	40.7	59.3	1,985	897	3,414	----------	----------
1942	160,301	22,088	50,514	----------	232,903	282,587	515,490	45.2	54.8	2,301	1,155	3,522	----------	----------
1943	179,008	24,266	46,531	----------	249,805	260,687	510,492	48.9	51.1	2,525	1,309	3,512	----------	----------
1944	202,875	24,505	46,809	----------	274,189	244,489	518,678	52.9	47.1	2,737	1,418	3,477	----------	----------
1945	198,668	22,758	41,086	----------	262,512	205,118	467,630	56.1	43.9	2,950	1,470	3,527	----------	----------
1946	186,975	20,595	37,771	----------	245,341	175,617	420,958	58.3	41.7	3,200	1,596	3,563	----------	----------
1947	229,836	22,775	45,546	----------	298,157	193,072	491,229	60.7	39.3	3,569	1,598	4,050	----------	----------
1948	232,217	20,377	42,762	450	295,806	164,206	460,012	64.3	35.7	[4] 3,965	1,688	4,162	15	(2)
1949	174,639	14,333	30,804	2,600	222,376	109,447	331,823	67.0	33.0	[4] 4,155	1,529	4,329	50	(2)

1950	218,126	14,303	35,446	4,850	272,725	120,119	392,844	69.4	30.6	[4] 4,228	1,368	4,446	90	(2)
1951	246,397	14,010	37,583	6,061	304,051	111,791	415,842	73.1	26.9	[4] 4,302	1,264	3,904	108	(2)
1952	218,982	10,667	31,130	8,215	268,994	87,431	356,425	75.5	24.5	[4] 4,083	1,068	3,569	152	(2)
1953	232,585	8,770	25,144	11,830	278,329	71,222	349,551	79.6	20.4	[4] 3,985	878	2,994	219	(2)
1954	206,546	5,083	15,005	16,336	242,970	46,142	289,112	84.0	16.0	[5] 4,224	681	2,162	325	90
1955	243,204	4,510	15,497	27,460	290,671	52,794	343,465	84.6	15.4	[5] 3,679	510	1,925	385	140
1956	248,341	3,883	15,271	39,907	307,402	58,372	365,774	84.0	16.0	[5] 3,666	472	1,819	510	188
1957	236,720	2,781	12,453	53,783	305,737	54,912	360,649	84.8	15.2	[5] 3,556	375	1,528	614	199
1958	178,014	1,560	7,626	56,373	243,573	43,311	286,884	84.9	15.1	[5] 3,212	249	1,230	679	222
1959	171,150	1,010	5,779	65,792	243,731	39,703	283,434	86.0	14.0	[5] 2,895	144	1,014	776	226
1960	162,109	1,232	4,517	77,928	245,786	39,102	284,888	86.3	13.7	[5] 2,707	159	931	879	245
1961	145,134	1,032	4,863	84,321	235,350	37,416	272,766	86.3	13.7	[5] 2,348	130	867	927	235
1962	145,962	488	4,296	90,174	240,920	40,346	281,266	85.7	14.3	[5] 2,235	100	825	961	267

[1] For separate data by type of loading, see Minerals Yearbook 1959, vol. 2, p. 86. Canvass of pit-car loaders discontinued in 1951.

[2] Data not available.

[3] Exclusive of tonnage "Handled by conveyors."

[4] Includes mobile loading machines used in conjunction with continuous mining.

[5] Mobile loading machines used in conjunction with continuous mining shown separately in last column of this table.

TABLE 39.—Bituminous coal and lignite mechanically loaded underground in the United States, by type of loading equipment

Type of loading equipment	1961		1962	
	Net tons	Percentage of total	Net tons	Percentage of total
Mobile machines:				
Direct into mine cars	5,931,074	2.5	5,864,992	2.4
Onto conveyors	6,755,764	2.9	4,358,543	1.8
Into shuttle cars	132,446,554	56.3	135,738,574	56.4
Continuous-mining machines:				
Onto conveyors	11,031,679	4.7	10,690,077	4.4
Into shuttle cars	73,289,572	31.1	79,484,252	33.0
Scrapers and conveyors equipped with duckbills or other self-loading heads	1,032,009	.4	488,157	.2
Hand-loaded conveyors	4,863,270	2.1	4,295,872	1.8
Total mechanically loaded	235,349,922	100.0	240,920,467	100.0

TABLE 40.—Comparative changes in underground mechanical loading of bituminous coal and lignite by principal types of loading devices in the United States, by States

State	Loading machines[1] (net tons)		Continuous-mining machines (net tons)		Hand-loaded conveyors (net tons)		Total mechanically loaded (net tons)		Total production at mines using mechanical loading devices (net tons)		Handled by each class (percent)					
											Loading machines[1]		Continuous-mining machines		Hand-loaded conveyors	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	8,541,293	8,758,483	430,600	273,653	303,420	307,745	9,275,313	9,339,881	9,276,302	9,339,881	92.1	93.8	4.6	2.9	3.3	3.3
Alaska	82,436	109,813	26,858	------	------	------	109,294	109,813	109,294	109,813	75.4	100.0	24.6	------	------	------
Arkansas	19,041	------	26,273	------	119,281	89,612	164,595	89,612	164,595	89,612	11.6	------	16.0	------	72.4	100.0
Colorado	1,325,065	1,194,279	1,464,134	1,340,422	276,683	210,873	3,065,882	2,745,574	3,075,106	2,769,061	43.2	43.5	47.8	48.8	9.0	7.7
Illinois	14,677,428	15,674,879	7,688,010	8,195,551	------	------	22,365,438	23,870,430	22,365,438	23,870,430	65.6	65.7	34.4	34.3	------	------
Indiana	3,294,846	3,482,166	1,238,605	849,122	------	------	4,533,451	4,331,288	4,533,451	4,331,288	72.7	80.4	27.3	19.6	------	------
Iowa	77,740	96,541	------	------	------	------	77,740	96,541	77,740	96,541	100.0	100.0	------	------	------	------
Kentucky	25,630,936	26,770,557	2,635,489	3,449,398	242,159	202,217	28,508,584	30,422,172	28,653,185	30,649,732	89.9	88.0	9.2	11.3	.9	.7
Maryland	------	------	------	62,444	136,321	89,759	136,321	152,203	153,979	160,859	------	------	------	41.0	100.0	59.0
Montana	82,348	68,692	------	------	2,343	2,395	84,691	71,087	84,691	71,087	97.2	96.6	------	------	2.8	3.4
New Mexico	------	------	360,768	251,670	609	1,114	361,377	252,784	362,781	254,853	------	------	99.8	99.6	.2	.4
Ohio	4,723,506	5,074,674	3,086,521	3,576,252	48,956	27,937	7,858,983	9,678,863	7,858,983	8,689,259	60.1	58.5	39.3	41.2	.6	.3
Oklahoma	------	------	------	72,414	143,435	83,831	143,435	156,245	144,456	156,245	------	------	------	46.3	100.0	53.7
Pennsylvania	10,702,581	10,089,318	27,883,481	29,881,295	963,787	930,722	39,549,849	40,901,335	39,828,167	41,040,688	27.1	24.7	70.5	73.0	2.4	2.3
Tennessee	1,734,439	1,768,831	129,584	282,452	187,814	158,974	2,051,837	2,210,257	2,055,994	2,210,257	84.5	80.0	6.3	12.8	9.2	7.2
Utah	3,256,516	2,515,560	1,899,527	1,779,520	------	------	5,156,043	4,295,080	5,156,043	4,295,080	63.2	58.6	36.8	41.4	------	------
Virginia	13,338,215	10,938,020	2,165,568	1,723,247	158,676	246,148	15,662,459	12,907,415	15,776,950	13,066,582	85.2	84.7	13.8	13.4	1.0	1.9
Washington	32,873	42,044	74,610	104,048	69,783	82,915	177,266	229,007	177,266	229,007	18.5	18.4	42.1	45.4	39.4	36.2
West Virginia	58,421,931	59,702,598	35,174,101	38,315,660	2,167,879	1,815,877	95,763,911	99,834,135	96,193,541	100,044,780	61.0	59.8	36.7	38.4	2.3	1.8
Wyoming	224,207	163,811	37,122	17,181	42,124	45,753	303,453	226,745	303,453	226,745	73.9	72.2	12.2	7.6	13.9	20.2
Total	146,165,401	146,450,266	84,321,251	90,174,329	4,863,270	4,295,872	235,349,922	240,920,467	236,351,415	241,702,400	62.1	60.8	35.8	37.4	2.1	1.8

---

[1] Includes mobile loading machines, scrapers, and conveyors equipped with duckbills or other self-loading heads.

TABLE 41.—Number of bituminous coal and lignite underground mines using mechanical loading devices and number of units in use in the United States, by States

State	Number of mines										Number of loading devices							
	Using loading machines only [1]		Using continuous mining machines only		Using hand-loaded conveyors only		Using more than one type of mechanical loading		Total		Loading machines				Continuous-mining machines		Hand-loaded conveyors (number of units)	
											Mobile [2]		Scrapers and duckbills or other self-loading conveyors					
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	15	17	1	------	12	9	5	2	33	28	116	103	4	4	18	3	50	45
Alaska	------	1	------	------	------	------	1	------	1	1	7	7	------	------	1	------	------	------
Arkansas	------	------	------	------	10	9	1	------	11	9	2	------	------	------	1	------	25	17
Colorado	31	37	4	7	15	17	5	3	55	64	63	68	32	22	22	24	42	45
Illinois	35	33	2	4	------	------	5	4	42	41	101	104	9	5	40	43	------	------
Indiana	15	13	1	1	------	------	2	3	18	17	56	61	------	------	12	11	------	------
Iowa	2	2	------	------	------	------	------	------	2	2	4	4	------	------	------	------	------	------
Kentucky	137	174	7	8	12	10	11	12	167	204	440	423	5	------	39	49	44	33
Maryland	------	------	------	1	8	7	------	------	8	8	------	------	------	------	------	1	24	16
Montana	6	11	------	------	2	1	------	------	8	12	9	13	4	8	------	------	3	1
New Mexico	------	------	1	2	2	2	------	------	3	4	------	5	------	------	5	5	1	1
Ohio	17	20	4	3	8	7	4	3	33	33	84	88	------	------	35	37	17	12
Oklahoma	------	------	------	------	7	4	------	1	7	5	------	------	------	------	------	1	37	77
Pennsylvania	65	68	34	46	100	93	27	29	226	236	337	338	30	27	353	355	236	235
Tennessee	18	19	1	3	25	20	1	------	45	42	31	31	10	12	2	4	41	31
Utah	29	28	3	3	------	------	7	8	39	39	117	119	3	3	28	32	------	------
Virginia	59	67	1	------	4	8	8	9	72	84	179	146	------	------	30	10	13	26
Washington	3	4	------	------	1	2	3	1	7	7	5	4	------	------	3	3	14	17
West Virginia	223	254	40	71	78	73	81	79	422	477	1,019	974	17	5	336	381	297	246
Wyoming	5	4	1	1	1	1	1	1	8	7	13	14	16	14	2	2	23	23
Total	660	752	100	150	285	263	162	155	1,207	1,320	2,583	2,502	130	100	927	961	867	825

---

[1] Includes mobile loading machines, scrapers, and conveyors equipped with duckbills or other self-loading heads.
[2] Includes mobile loading machines used in conjunction with continuous mining.

TABLE 42.—Production at bituminous coal and lignite underground mines in the United States, by States and methods of loading

State	Hand loaded (net tons)		Mechanically loaded (net tons)		Total underground production (net tons)		Underground output hand loaded (percent)		Underground output mechanically loaded (percent)	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	801, 111	650, 197	9, 275, 313	9, 339, 881	10, 076, 424	9, 990, 078	8.0	6.5	92.0	93.5
Alaska	----	----	109, 294	109, 813	109, 294	109, 813	----	----	100.0	100.0
Arkansas	----	----	164, 595	89, 612	164, 595	89, 612	----	----	100.0	100.0
Colorado	90, 696	73, 243	3, 065, 882	2, 745, 574	3, 156, 578	2, 818, 817	2.9	2.6	97.1	97.4
Georgia	4, 426	7, 830	----	----	4, 426	7, 830	100.0	100.0	----	----
Illinois	52, 110	31, 881	22, 365, 438	23, 870, 430	22, 417, 548	23, 902, 311	.2	.1	99.8	99.9
Indiana	75, 418	68, 683	4, 533, 451	4, 331, 288	4, 608, 869	4, 399, 971	1.6	1.6	98.4	98.4
Iowa	69, 816	67, 141	77, 740	96, 541	147, 556	163, 682	47.3	41.0	52.7	59.0
Kansas	1, 882	2, 189	----	----	1, 882	2, 189	100.0	100.0	----	----
Kentucky	10, 313, 291	12, 445, 919	28, 508, 584	30, 422, 172	38, 821, 875	42, 868, 091	26.6	29.0	73.4	71.0
Maryland	150, 789	199, 813	136, 321	152, 203	287, 110	352, 016	52.5	56.8	47.5	43.2
Missouri	70, 946	56, 419	----	----	70, 946	56, 419	100.0	100.0	----	----
Montana:										
Bituminous	5, 067	4, 894	84, 691	69, 769	89, 758	74, 663	5.6	6.6	94.4	93.4
Lignite	10, 096	6, 712	----	1, 318	10, 096	8, 030	100.0	83.6	----	16.4
Total Montana	15, 163	11, 606	84, 691	71, 087	99, 854	82, 693	15.2	14.0	84.8	86.0
New Mexico	35, 516	26, 458	361, 377	252, 784	396, 893	279, 242	8.9	9.5	91.1	90.5
North Dakota (lignite)	1, 981	2, 059	----	----	1, 981	2, 059	100.0	100.0	----	----
Ohio	651, 533	655, 135	7, 858, 983	8, 678, 863	8, 510, 516	9, 333, 998	7.7	7.0	92.3	93.0
Oklahoma	5, 261	2, 660	143, 435	156, 245	148, 696	158, 905	3.5	1.7	96.5	98.3
Pennsylvania	1, 892, 798	1, 579, 378	39, 549, 849	40, 901, 335	41, 442, 647	42, 480, 713	4.6	3.7	95.4	96.3
Tennessee	1, 783, 143	1, 510, 461	2, 051, 837	2, 210, 257	3, 834, 980	3, 720, 718	46.5	40.6	53.5	59.4
Utah	3, 202	1, 940	5, 156, 043	4, 295, 080	5, 159, 245	4, 297, 020	.1	.1	99.9	99.9
Virginia	12, 547, 390	13, 820, 795	15, 662, 459	12, 907, 415	28, 209, 849	26, 728, 210	44.5	51.7	55.5	48.3
Washington	7, 097	3, 835	177, 266	229, 007	184, 363	232, 842	3.8	1.6	96.2	98.4
West Virginia	8, 841, 260	9, 126, 113	95, 763, 911	99, 834, 135	104, 605, 171	108, 960, 248	8.5	8.4	91.5	91.6
Wyoming	1, 234	2, 146	303, 453	226, 745	304, 687	228, 891	.4	.9	99.6	99.1
Total	37, 416, 063	40, 345, 901	235, 349, 922	240, 920, 467	272, 765, 985	281, 266, 368	13.7	14.3	86.3	85.7

TABLE 43.—Units of mechanical loading equipment sold to bituminous coal and lignite mines for underground use in the United States, as reported by manufacturers

Type of equipment	1958	1959	1960	1961	1962	Change from 1961 (percent)
Mobile loading machines	97	95	110	84	113	+34.5
Continuous mining machines	107	140	128	115	149	+29.6
Scrapers	1					
Conveyors [1]	92	65	47	66	58	−12.1
Total	297	300	285	265	320	+20.8
Number of manufacturers reporting	18	17	18	15	15	

[1] Includes hand-loaded conveyors and those equipped with duckbills or other self-loading heads.

TABLE 44.—Units of mechanical loading equipment sold for use in bituminous coal and lignite mines in the United States, as reported by manufacturers, by States

State	Mobile loading machines		Continuous mining machines		Room conveyors [1]	
	1961	1962	1961	1962	1961	1962
Alabama	10	10	1	1	3	
Colorado			6			
Illinois	4	5	7	7		
Indiana		1	1		1	
Kentucky	5	42	6	17	4	5
Ohio	3	5	3	3		
Oklahoma						1
Pennsylvania	10	15	40	56	8	28
Tennessee	2	1	1	2	1	3
Utah	1		1	5		
Virginia	2	2	7	3		
West Virginia	47	32	42	55	49	21
Total	84	113	115	149	66	58

[1] Includes hand-loaded conveyors and those equipped with duckbills or other self-loading heads.

TABLE 45.—Units of conveying equipment sold for use in bituminous coal and lignite mines in the United States, as reported by manufacturers, by States

State	Bridge conveyors		Shuttle cars		Gathering and haulage conveyors [1]	
	1961	1962	1961	1962	1961	1962
Alabama	2	1	15	7	10	6
Colorado			12		2	1
Illinois	2		3	5	4	10
Indiana					3	10
Kentucky	4	7	20	38	15	14
Maryland			2			
New Mexico						1
Ohio			2	11	3	4
Oklahoma		1				
Pennsylvania	3	16	53	60	33	63
Tennessee	1	2	4		1	1
Utah			3	1		1
Virginia		1	2	6	10	12
West Virginia	32	33	98	58	30	48
Total	44	61	214	186	111	171

[1] Includes all gathering and haulage conveyors with a capacity over 500 feet, except main-slo p

MECHANICAL CLEANING

Mechanical cleaning means cleaning raw coal with mechanical devices that separate out impurities, usually by differences in specific gravity, and does not include coal that is only screened. Mechanical devices are divided into two general classes—wet and pneumatic. About 93 percent of the coal cleaned in 1962 was cleaned by wet methods. The various types of mechanical cleaning equipment are described in detail in Minerals Yearbook, 1953.[5]

All coal mechanically cleaned in 1962 has been classified into seven types. The percentage of total production cleaned by each class was as follows: Jigs (50), dense-medium processes (25), concentrating tables (12), pneumatic cleaning (7), classifiers (2), launders (2), and flotation (2). Magnetite and sand were most commonly used as mediums in cleaning bituminous coal by the dense-medium processes. Magnetite was used in cleaning 38 million tons, and sand was used in cleaning 27 million tons. The revised figures on coal cleaned with magnetite as the medium is 33 million tons in each year, 1960–61.

Although mechanical cleaning by froth flotation has been in use at bituminous coal mines in the United States since 1930, it was not until 1960 that the tonnage cleaned by this method was large enough to be listed separately. Bituminous coal cleaned by froth flotation increased from 1,826,000 tons in 1960 to 3,959,000 in 1962.

---

[5] Young, W. H., R. L. Anderson, and E. M. Hall. Coal—Bituminous and Lignite. BuMines Minerals Yearbook, 1953, v. 2, 1956, pp. 94–96.

TABLE 46.—Growth of mechanical cleaning at bituminous coal and lignite mines in the United States

Year	Total production (thousand tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (thousand tons)	Cleaned coal (thousand tons)	Refuse (thousand tons)	Percentage of refuse to raw coal	
1927	517,763	(1)	(1)	27,692	(1)	(1)	5.3
1928	500,745	236	(1)	28,783	(1)	(1)	5.7
1929	534,989	280	40,241	36,799	3,442	8.6	6.9
1930	467,526	297	42,645	38,800	3,845	9.0	8.3
1931	382,089	312	39,529	36,172	3,357	8.5	9.5
1932	309.710	309	32,903	30,278	2,625	8.0	9.8
1933	333.630	290	37,682	34.558	3,124	8.3	10.4
1934	359,368	293	43,556	39,827	3,729	8.6	11.1
1935	372,373	320	49,473	45,361	4,112	8.3	12.2
1936	439,088	342	67,162	61,095	6,067	9.0	13.9
1937	445,531	(1)	(1)	65,000	(1)	(1)	14.6
1938	348,545	374	71,207	63,455	7,752	10.9	18.2
1939	394,855	366	88,895	79,429	9,466	10.6	20.1
1940	460,771	387	115,692	102,270	13,422	11.6	22.2
1941	514.149	417	133,379	117,540	15.839	11.9	22.9
1942	582,693	438	162,598	142,187	20,411	12.6	24.4
1943	590,177	432	167,310	145,576	21,734	13.0	24.7
1944	619,576	439	182,071	158,727	23,344	12.8	25.6
1945	577,617	439	172,899	147.886	25,013	14.5	25.6
1946	533,922	445	163,633	138,670	24,963	15.3	26.0
1947	630,624	461	206,620	174.436	32,184	15.6	27.7
1948	599,518	502	215,217	180,880	34,337	16.0	30.2
1949	437,868	571	184,691	153,652	31,039	16.8	35.1
1950	516,311	612	238,391	198,699	39,692	16.7	38.5
1951	533,665	631	289,838	240,010	49,828	17.2	45.0
1952	466,841	625	274,246	227,265	46,981	17.1	48.7
1953	457,290	611	295,654	241,759	53,895	18.2	52.9
1954	391,706	613	287,004	232,764	54,240	18.9	59.4
1955	464,633	575	335,458	272,715	62,743	18.7	58.7
1956	500,874	583	359,378	292,365	67,013	18.6	58.4
1957	492,704	593	376,546	304,027	72,519	19.3	61.7
1958	410,446	573	320,898	259,035	61,863	19.3	63.1
1959	412,028	555	337,138	269,787	67,351	20.0	65.5
1960	415,512	535	338,686	273,169	65,517	19.3	65.7
1961	402,977	503	328,200	264,711	63,489	19.3	65.7
1962	422,149	508	339,408	271,633	67,775	20.0	64.3

---

[1] Data not available.

TABLE 47.—Mechanical cleaning at bituminous coal and lignite mines in the United States, 1962, by States

State	Total production (net tons)	Mechanical cleaning					Percentage of total production mechanically cleaned
		Number of cleaning plants	Raw coal (net tons)	Cleaned coal (net tons)	Refuse (net tons)	Percentage of refuse to raw coal	
Alabama	12, 879, 660	33	16, 676, 294	11, 016, 743	5, 659, 551	33. 9	85. 5
Alaska	871, 379	4	637, 800	372, 862	264, 938	41. 5	42. 8
Arkansas	255, 739	(1)	(1)	(1)	(1)	(1)	(1)
Colorado	3, 379, 400	[2] 4	[2] 1, 283, 133	[2] 1, 011, 803	[2] 271, 330	[2] 21. 1	[2] 27. 8
Illinois	48, 487, 362	54	53, 600, 784	43, 918, 398	9, 682, 386	18. 1	90. 6
Indiana	15, 708, 902	16	14, 412, 872	11, 847, 002	2, 565, 870	17. 8	75. 4
Kansas	914, 999	4	1, 342, 347	879, 668	462, 679	34. 5	96. 1
Kentucky	69, 212, 019	77	51, 207, 455	41, 726, 820	9, 480, 635	18. 5	60. 3
Missouri	2, 895, 967	7	2, 815, 979	1, 994, 488	821, 491	29. 2	68. 9
Montana (bituminous)	77, 663	3	35, 454	31, 945	3, 509	9. 9	41. 1
New Mexico	677, 157	1	430, 000	251, 670	178, 330	41. 5	37. 2
Ohio	34, 124, 663	20	15, 872, 384	13, 186, 941	2, 685, 443	16. 9	38. 6
Oklahoma	1, 048, 048	2	265, 825	229, 721	36, 104	13. 6	21. 9
Pennsylvania	65, 315, 386	91	51, 842, 860	40, 261, 140	11, 581, 720	22. 3	61. 6
Tennessee	6, 213, 611	1	79, 495	75, 520	3, 975	5. 0	1. 2
Utah	4, 297, 020	7	3, 440, 723	2, 774, 284	666, 439	19. 4	64. 6
Virginia	29, 474, 323	24	15, 387, 065	12, 832, 402	2, 554, 663	16. 6	43. 5
Washington	234, 957	5	336, 127	230, 037	106, 090	31. 6	97. 9
West Virginia	118, 499, 067	153	109, 682, 122	88, 933, 759	20, 748, 363	18. 9	75. 1
Wyoming	2, 568, 724	2	59, 162	57, 396	1, 766	3. 0	2. 2
Other States [3]	5, 013, 279						
Total	422, 149, 325	508	339, 407, 881	271, 632, 599	67, 775, 282	20. 0	64. 3

[1] Included in Colorado.
[2] Includes Arkansas.
[3] Includes Georgia, Iowa, Maryland, and lignite from Montana, North Dakota, and South Dakota.

TABLE 48.—Mechanical cleaning of bituminous coal and lignite in the United States, by types of equipment

Year	Wet methods							Pneumatic methods	Grand total
	Jigs	Concentrating tables	Classifiers	Launders	Dense-medium processes	Unclassified [1]	Total		
CLEAN COAL (THOUSAND NET TONS)									
1938	27,615	984	4,521	10,681	4,450	4,936	53,187	10,268	63,455
1939	37,056	1,402	5,917	12,809	4,683	5,867	67,734	11,695	79,429
1940	47,064	2,330	7,762	16,269	6,692	7,173	87,290	14,980	102,270
1941	53,287	2,510	8,177	16,954	9,344	10,106	100,378	17,162	117,540
1942	66,876	3,138	10,529	18,658	12,495	10,304	122,000	20,187	142,187
1943	66,092	2,929	11,854	17,424	13,388	12,688	124,375	21,201	145,576
1944	74,175	2,753	14,780	19,686	13,869	13,400	138,663	20,064	158,727
1945	68,609	2,594	14,203	18,980	12,875	13,209	130,470	17,416	147,886
1946	64,702	1,447	13,883	16,021	14,173	11,833	122,059	16,611	138,670
1947	85,931	2,980	14,648	17,902	17,702	16,920	156,083	18,353	174,436
1948	87,506	4,360	18,304	16,788	20,638	17,068	164,664	16,216	180,880
1949	72,423	4,040	14,865	11,238	17,821	20,321	140,708	12,944	153,652
1950	94,161	4,693	18,059	11,630	28,948	25,679	183,170	15,529	198,699
1951	101,746	5,811	23,174	10,362	33,840	46,497	221,430	18,580	240,010
1952	97,336	3,723	19,296	11,738	31,321	45,205	208,619	18,646	227,265
1953	101,001	4,002	18,312	11,988	36,805	50,386	222,494	19,265	241,759
1954	99,913	6,606	16,115	12,156	43,104	36,143	214,037	18,727	232,764
1955	114,538	7,443	17,656	11,400	49,332	52,051	252,420	20,295	272,715
1956	124,858	9,535	15,064	10,223	56,937	51,437	268,054	24,311	292,365
1957	133,844	14,389	14,282	8,306	63,678	44,760	279,259	24,768	304,027
1958	115,321	18,142	8,793	6,768	52,735	38,394	240,153	18,882	259,035
1959	126,836	27,453	8,935	7,305	66,951	14,058	251,538	18,249	269,787
1960	136,633	30,741	11,012	7,561	66,251	2,832	255,030	18,139	273,169
1961	133,360	30,158	9,263	6,529	65,148	2,562	247,020	17,691	264,711
1962	136,879	31,859	5,681	5,986	68,565	3,959	252,929	18,704	271,633
PERCENTAGE CLEANED									
1938	43.5	1.6	7.1	16.8	7.0	7.8	83.8	16.2	100.0
1939	46.6	1.8	7.5	16.1	5.9	7.4	85.3	14.7	100.0
1940	46.0	2.3	7.6	15.9	6.5	7.0	85.3	14.7	100.0
1941	45.3	2.2	7.0	14.4	7.9	8.6	85.4	14.6	100.0
1942	47.0	2.2	7.4	13.1	8.8	7.3	85.8	14.2	100.0
1943	45.4	2.0	8.1	12.0	9.2	8.7	85.4	14.6	100.0
1944	46.7	1.8	9.3	12.4	8.8	8.4	87.4	12.6	100.0
1945	46.4	1.8	9.6	12.8	8.7	8.9	88.2	11.8	100.0
1946	46.7	1.0	10.0	11.6	10.2	8.5	88.0	12.0	100.0
1947	49.3	1.7	8.4	10.3	10.1	9.7	89.5	10.5	100.0
1948	48.4	2.4	10.1	9.3	11.4	9.4	91.0	9.0	100.0
1949	47.1	2.6	9.7	7.3	11.6	13.3	91.6	8.4	100.0
1950	47.4	2.4	9.1	5.8	14.6	12.9	92.2	7.8	100.0
1951	42.4	2.4	9.7	4.3	14.1	19.4	92.3	7.7	100.0
1952	42.8	1.6	8.5	5.2	13.8	19.9	91.8	8.2	100.0
1953	41.8	1.6	7.6	4.9	15.2	20.9	92.0	8.0	100.0
1954	42.8	3.0	5.7	3.9	21.8	17.9	95.1	4.9	100.0
1955	42.0	2.7	6.5	4.2	18.1	19.1	92.6	7.4	100.0
1956	42.7	3.3	5.1	3.5	19.5	17.6	91.7	8.3	100.0
1957	44.0	4.8	4.7	2.7	21.0	14.7	91.9	8.1	100.0
1958	44.5	7.0	3.4	2.6	20.4	14.8	92.7	7.3	100.0
1959	47.0	10.2	3.3	2.7	24.8	5.2	93.2	6.8	100.0
1960	50.0	11.3	4.0	2.8	24.3	1.0	93.4	6.6	100.0
1961	50.4	11.4	3.5	2.4	24.6	1.0	93.3	6.7	100.0
1962	50.4	11.7	2.1	2.2	25.2	1.5	93.1	6.9	100.0

---

[1] Of the total unclassified tonnage in 1960, 1,826,000 net tons was cleaned by flotation. In 1961 and 1962, all of the tonnage under "Unclassified" was cleaned by flotation.

TABLE 49.—Mechanical cleaning at bituminous coal and lignite mines in the United States, by underground, strip, and auger mining

Year	Underground mines			Strip mines			Auger mines			Total, all mines		
	Total production (net tons)	Cleaned		Total production (net tons)	Cleaned		Total production (net tons)	Cleaned		Total production (net tons)	Cleaned	
		Net tons	Percent		Net tons	Percent		Net tons	Percent		Net tons	Percent
1953	349,550,972	194,934,599	55.8	105,448,569	46,202,508	43.8	2,290,908	621,470	27.1	457,290,449	241,758,577	52.9
1954	289,112,031	184,372,053	63.8	98,134,250	47,772,295	48.7	4,460,019	619,675	13.9	391,706,300	232,764,023	59.4
1955	343,465,239	217,199,126	63.2	115,092,769	54,423,341	47.3	6,075,400	1,093.017	18.0	464,633,408	272,715,484	58.7
1956	365,774,043	232,231,914	63.5	127,055,382	58,271,513	45.9	8,044,652	1,861,957	23.1	500,874,077	292,365,384	58.4
1957	360,649,141	242,981,446	67.4	124,108,538	59,317,324	47.8	7,946,237	1,728,424	21.8	492,703.916	304,027,194	61.7
1958	286,884,244	198,710,828	69.3	116,241,787	58,932,257	50.7	7,319,516	1,391,766	19.0	410,445.547	259,034,851	63.1
1959	283,433,655	203,829,017	71.9	120,953,334	64,417,972	53.3	7,640,513	1,539,698	20.2	412,027,502	269,786,687	65.5
1960	284,888,310	205,804,076	72.2	122,629,664	66,356,125	54.1	7,994,373	1,008,493	12.6	415,512,347	273,168,694	65.7
1961	272,765,985	199,359,507	73.1	121,979.084	64,500.929	52.9	8,231,733	850,506	10.3	402,976,802	264,710,942	65.7
1962	281,266,368	200,662,784	71.3	130,300,224	69,489,985	53.3	10,582,733	1,479,830	14.0	422,149,325	271,632,599	64.3

TABLE 50.—Mechanical cleaning at bituminous coal and lignite mines in the United States, 1962, by States and by underground, strip, and auger mining

State	Underground mines			Strip mines		
	Total production (net tons)	Cleaned		Total production (net tons)	Cleaned	
		Net tons	Percent		Net tons	Percent
Alabama	9,990.078	9,484,729	94.9	2,773,953	1,416,385	51.1
Alaska	109,813	----------	----------	761,566	372,862	49.0
Arkansas	89,612	(1)	(1)	166,127	(1)	(1)
Colorado	2,818,817	[2] 988,252	[2] 34.0	560,583	[2] 23,551	[2] 3.2
Illinois	23,902,311	20,457,232	85.6	24,585,051	23,461,166	95.4
Indiana	4,399,971	3,292,374	74.8	11,308,931	8,554,628	75.6
Kansas	2,189	----------	----------	912,810	879,668	96.4
Kentucky	42,868,091	23,636,328	55.1	22,438,327	17,831,363	79.5
Missouri	56,419	----------	----------	2,839,548	1,994,488	70.2
Montana (bituminous)	74,663	31,945	42.8	3,000	----------	----------
New Mexico	279.242	251,670	90.1	397,915	----------	----------
Ohio	9,333,998	4,948,613	53.0	23,441.780	8,061,824	34.4
Oklahoma	158,905	109,040	68.6	889,143	120,681	13.6
Pennsylvania	42,480,713	35,426,733	83.4	22,207,175	4,813,654	21.7
Tennessee	3,720,718	13,717	.4	2,275,233	53,803	2.4
Utah	4,297,020	2,774,284	64.6	----------	----------	----------
Virginia	26,728,210	12,404,960	46.4	1,792,473	332,630	18.6
Washington	232,842	227,922	97.9	2,115	2,115	100.0
West Virginia	108,960,248	86,557,589	79.4	6,124,999	1,571,167	25.7
Wyoming	228.891	57,396	25.1	2,339,833	----------	----------
Other States [3]	533.617	----------	----------	4,479,662	----------	----------
Total	281,266,368	200,662,784	71.3	130,300,224	69,489,985	53.3

See footnotes at end of table.

TABLE 50.—Mechanical cleaning at bituminous coal and lignite mines in the United States, 1962, by States and by underground, strip, and auger mining—Continued

State	Auger mines			Total, all mines		
	Total production (net tons)	Cleaned		Total production (net tons)	Cleaned	
		Net tons	Percent		Net tons	Percent
Alabama	115,629	115,629	100.0	12,879,660	11,016,743	85.5
Alaska				871,379	372,862	42.8
Arkansas				255,739	(1)	(1)
Colorado				3,379,400	[2] 1,011,803	[2] 27.8
Illinois				48,487,362	43,918,398	90.6
Indiana				15,708,902	11,847,002	75.4
Kansas				914,999	879,668	96.1
Kentucky	3,905,601	259,129	6.6	69,212,019	41,726,820	60.3
Missouri				2,895,967	1,994,488	68.9
Montana (bituminous)				77,663	31,945	41.1
New Mexico				677,157	251,670	37.2
Ohio	1,348,885	176,504	13.1	34,124,663	13,186,941	38.6
Oklahoma				1,048,048	229,721	21.9
Pennsylvania	627,498	20,753	3.3	65,315,386	40,261,140	61.6
Tennessee	217,660	8,000	3.7	6,213,611	75,520	1.2
Utah				4,297,020	2,774,284	64.6
Virginia	953,640	94,812	9.9	29,474,323	12,832,402	43.5
Washington				234,957	230,037	97.9
West Virginia	3,413,820	805,003	23.6	118,499,067	88,933,759	75.1
Wyoming				2,568,724	57,396	2.2
Other States [3]				5,013,279		
Total	10,582,733	1,479,830	14.0	422,149,325	271,632,599	64.3

---

[1] Included in Colorado.
[2] Includes Arkansas.
[3] Includes Georgia, Iowa, Maryland, and lignite from Montana, North Dakota ,and South Dakota.

MECHANICAL CRUSHING

TABLE 51.—Mechanical crushing of bituminous coal and lignite at mines in the United States [1]

Year	Number of mines crushing coal	Coal crushed (net tons)	Percentage of production crushed at mines where crushing is done	Percentage of total production crushed	Percentage of production mechanically cleaned at mines where crushing is done
1940	716	35,251,061	19.3	7.7	(2)
1944	814	66,460,564	29.6	10.8	(2)
1945	830	70,936,898	32.4	12.3	(2)
1946	851	66,663,732	31.8	12.5	39.9
1947	904	88,985,858	35.7	14.1	41.4
1948	995	91,564,311	36.6	15.3	42.1
1949	1,120	77,327,691	39.0	17.7	47.3
1950	1,210	101,594,731	40.1	19.7	50.6
1951	1,374	118,663,712	39.6	22.2	54.8
1952	1,325	108,102,158	40.5	23.2	59.6
1953	1,239	116,493,415	42.5	25.5	62.7
1954	982	122,288,369	51.8	31.2	69.8
1955	1,225	161,470,318	52.8	34.8	68.4
1956	1,370	172,389,802	54.6	34.4	68.0
1957	1,452	173,098,257	52.5	35.0	70.5
1958	1,359	146,749,108	53.8	35.8	74.5
1959	1,393	151,225,633	51.9	36.7	74.3
1960	1,348	160,875,418	55.1	38.7	74.3
1961	1,217	146,765,297	52.3	36.4	77.6
1962	1,202	159,654,414	53.0	37.8	77.4

---

[1] Data not available for 1941–43. Lignite and Virginia semianthracite mines are not included in 1940–49.
[2] Data not available.

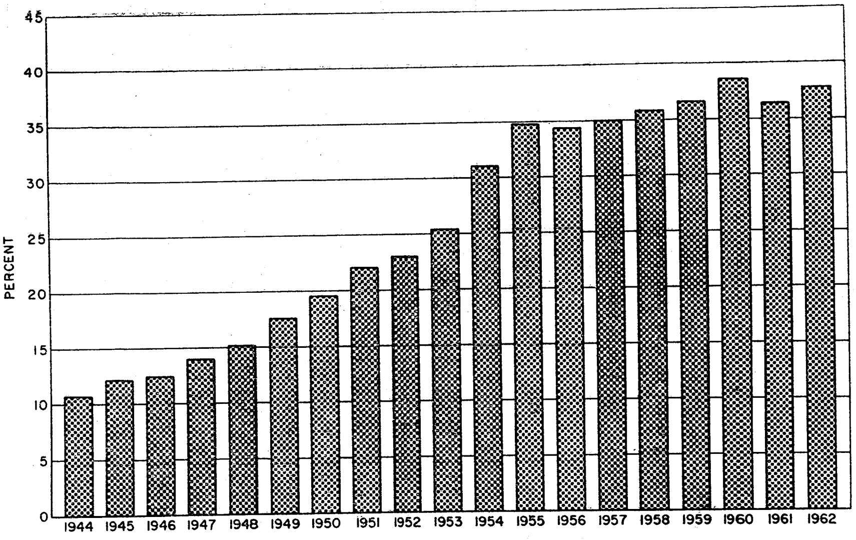


FIGURE 11.—Percentage of total production of bituminous coal and lignite crushed at mines in the United States, 1944–62.

TABLE 52.—Mechanical crushing of bituminous coal and lignite at mines in the United States, by States

State	Number of mines crushing coal		Coal crushed (net tons)		Percentage of production crushed at mines where crushing is done		Percentage of total production crushed	
	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	24	23	5, 496, 732	4, 872, 350	55. 1	51. 1	42. 6	37. 8
Alaska	4	4	533, 130	584, 747	86. 3	86. 3	72. 4	67. 1
Arkansas	10	7	280, 664	134, 289	93. 2	84. 7	71. 1	52. 5
Colorado	40	45	760, 743	1, 131, 507	48. 7	62. 0	20. 7	33. 5
Illinois	74	73	17, 427, 966	19, 716, 112	42. 5	41. 4	38. 5	40. 7
Indiana	30	26	8, 113, 157	7, 317, 593	55. 6	51. 4	53. 7	46. 6
Iowa	22	22	650, 258	896, 267	79. 9	85. 3	70. 1	79. 3
Kansas	2	2	531, 120	604, 563	99. 7	99. 9	80. 0	66. 1
Kentucky	125	125	19, 242, 280	22, 198, 454	55. 3	58. 2	30. 5	32. 1
Maryland	14	10	225. 837	136, 626	67. 3	53. 4	29. 8	16. 6
Missouri	10	12	1, 222, 003	821, 736	58. 8	51. 7	41. 6	28. 4
Montana:								
Bituminous	7	7	40, 817	25, 836	52. 0	50. 1	41. 9	33. 3
Lignite	------	1	------------	295, 360	------	100. 0	------	97. 0
Total Montana	7	8	40, 817	321, 196	52. 0	92. 6	41. 9	84. 0
New Mexico	2	4	376, 016	648. 385	100. 0	99. 8	93. 5	95. 8
North Dakota (lignite)	15	14	2, 104, 858	1, 925, 840	82. 5	81. 6	77. 2	70. 5
Ohio	117	110	11, 897, 619	11, 434, 995	47. 0	44. 4	36. 9	33. 5
Oklahoma	14	9	618, 221	657, 296	89. 0	87. 6	59. 9	62. 7
Pennsylvania	280	271	27, 541, 041	31, 972, 226	65. 2	70. 5	44. 0	49. 0
South Dakota (lignite)	1	1	5, 600	7, 105	31. 5	39. 7	31. 5	39. 7
Tennessee	29	22	1, 136. 341	1, 388, 202	81. 1	62. 4	19. 4	22. 3
Utah	37	36	3, 826, 796	3, 082, 288	74. 5	71. 9	74. 2	71. 7
Virginia	55	62	8, 412, 787	10, 145, 277	53. 6	67. 4	27. 7	34. 4
Washington	7	7	20, 375	43, 025	11. 7	19. 3	10. 7	18. 3
West Virginia	286	300	34, 272. 404	37, 570, 603	44. 0	43. 4	30. 3	31. 7
Wyoming	12	9	2, 028, 532	2, 043, 732	85. 3	99. 2	80. 2	79. 6
Total	1, 217	1, 202	146, 765, 297	159, 654, 414	52. 3	53. 0	36. 4	37. 8

TREATMENT FOR ALLAYING DUST

TABLE 53.—Treatment of bituminous coal and lignite at mines for allaying dust in the United States[1]

Year	Grand total production (net tons)	Total production at mines where coal was treated (net tons)	Percentage of production treated at mines where treating is done	Percentage of total production treated	Net tons treated with—				
					Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	460,771,500	161,089,959	22.1	7.7	2,633,291	25,767,651	4,428,113	2,807,728	35,636,783
1941	514,149,245	197,476,343	20.0	7.7	3.957,459	29.258,462	2,482,899	3,844,476	39,543,296
1942	582.692,937	202,973,885	17.3	6.0	10.132,809	11,302,020	6,544,658	7,148,064	35,127,551
1943	590.177,069	153,863,052	17.3	4.5	15,049,176	1,720,176	1,947,219	7,966.484	26,683.055
1944	619,576,240	172,955,108	17.8	5.0	7,276,702	13,188,883	4,744,580	5,562,565	30,772,730
1945	577,617,327	166,935,955	20.1	5.8	5,115,090	18,875,674	4,647,872	4,910,602	33.549,238
1946	533.922,068	166,814.848	22.2	6.9	4,957,622	24,310,109	3.193.070	4,572,360	37.033,161
1947	630,623.722	195,840.059	26.4	8.2	5,822.483	34,667,571	5,571,953	5,732,101	51,794,108
1948	599,518.229	196,600,489	25.6	8.4	6,275.121	34,466,534	4,177,987	5,462.054	50,381,696
1949	437,868,036	160,978,742	26.0	9.5	3,670,120	30,448,670	4,380,961	3,275,151	41,774,902
1950	516,311,053	210.083,657	25.9	10.5	4,643.186	41,688,159	4,278,212	3,724,314	54,333,871
1951	533,664,732	228,802,637	25.6	11.0	4,694,938	46,142,726	4,587,940	3 172.205	58.597.809
1952	466,840,782	211,437.141	24.4	11 0	4,954,080	41,409,886	3,432,199	1,772,111	51,568.276
1953	457,290,449	206,374,498	23.7	10.7	3,362,552	40,671,431	2,769,833	2,154,985	48,958,801
1954	391,706,300	202,098,539	27.9	14.4	2,959,979	47,782,165	3,366,955	2,255,872	56,364,971
1955	464,633,408	236,115,318	26.5	13.5	3,160,729	51,157,769	5,696.447	2,513,752	62,528,697
1956	500,874,077	243.513,231	26.6	12.9	5,500,522	52,008,545	4,912,374	2,309,732	64.731,173
1957	492,703,916	241,733,935	25.6	12.5	4,112,934	52,051,076	3,809,132	1,852.051	61,825,193
1958	410,445,547	188,245,095	28.3	13 0	3,359,434	42,922,129	4,122,397	2,862,670	53,266.630
1959	412,027,502	213,407,336	25.6	13.3	2,716,638	45,139,888	3,419,852	3,403,320	54,679,698
1960	415,512,347	221,644,878	26.0	13.9	4,576,176	46,241,261	4,333,350	2,469,508	57,620,295
1961	402,976,802	201,807,196	24.6	12.3	3,616,536	39,130,370	3.448,677	3,385,980	49,581,563
1962	422,149,325	217,853,086	23.0	11.8	3,128,468	39,822,318	3,025,489	4,047,823	50,024,098

Year	Number of mines treating with—					Percentage of tonnage treated with—				
	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total [2]	Calcium chloride	Oil	Calcium chloride and oil	All other materials	Total
1940	51	486	22	62	614	7.4	72.3	12.4	7.9	100.0
1941	67	564	15	58	668	10.0	74.0	6.3	9.7	100.0
1942	167	334	73	117	603	28.8	32.2	18.6	20.4	100.0
1943	212	67	28	101	393	56.4	6.4	7.3	29.9	100.0
1944	145	192	47	83	434	23.6	42.9	15.4	18.1	100.0
1945	105	296	43	67	487	15.2	56.3	13.9	14.6	100.0
1946	79	380	41	51	546	13.4	65.6	8.6	12.4	100.0
1947	67	384	58	45	546	11.2	66.9	10.8	11.1	100.0
1948	68	474	48	46	629	12.5	68.4	8.3	10.8	100.0
1949	91	586	62	34	769	8.8	72.9	10.5	7.8	100.0
1950	106	688	32	45	838	8.5	76.7	7.9	6.9	100.0
1951	98	764	40	27	898	8.0	78.8	7.8	5.4	100.0
1952	101	723	30	20	865	9.6	80.3	6.7	3.4	100.0
1953	81	681	28	26	785	6.8	83.1	5.7	4.4	100.0
1954	83	614	29	29	737	5.2	84.8	6.0	4.0	100.0
1955	63	650	33	28	757	5.1	81.8	9.1	4.0	100.0
1956	73	642	35	30	763	8.5	80.3	7.6	3.6	100.0
1957	71	665	31	34	785	6.6	84.2	6.2	3.0	100.0
1958	60	596	36	33	720	6.3	80.6	7.7	5.4	100.0
1959	54	615	44	37	743	5.0	82.6	6.2	6.2	100.0
1960	64	635	56	26	748	7.9	80.3	7.5	4.3	100.0
1961	48	544	32	32	643	7.3	78.9	7.0	6.8	100.0
1962	36	534	32	44	638	6.3	79.6	6.0	8.1	100.0

---

[1] All items except "Grand total production" exclude lignite and semianthracite, 1940–49. Data for 1940–45 include all mines with an average daily production of 50 tons and all mines with rail or river connections regardless of size. Data for 1946–62 include all mines producing 1,000 or more tons. The figures are reasonably comparable for all years.

[2] Because some mines used more than 1 method of treatment, this total is not the sum of the individual items.

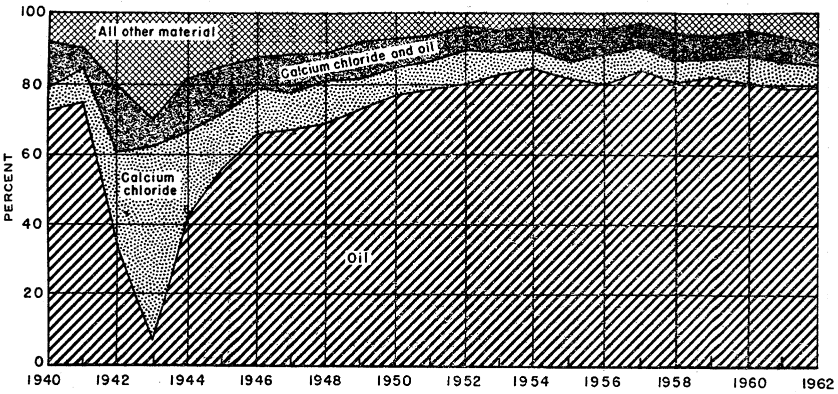


FIGURE 12.—Percentage of total bituminous coal and lignite treated for allaying dust at mines in the United States, 1940–62, by type of agent used.

TABLE 54.—Treatment of bituminous coal and lignite at mines for allaying dust in the United States, by States

State	Number of mines treating coal		Coal treated (net tons)		Percentage of production treated at mines where treating is done		Percentage of total production treated	
	1961	1962	1961	1962	1961	1962	1961	1962
Alabama	4	4	53,740	88,549	23.3	40.8	0.4	0.7
Arkansas	2	2	3,500	3,170	23.8	22.0	.9	1.2
Colorado	42	38	256,374	239,237	18.4	14.9	7.0	7.1
Illinois	67	69	4,053,195	4,299,526	10.5	9.7	9.0	8.9
Indiana	25	23	1,002,536	1,003,775	9.4	8.6	6.6	6.4
Iowa	5	5	11,579	13,277	11.6	9.9	1.2	1.2
Kansas	2	3	17,787	50,838	2.9	5.9	2.7	5.6
Kentucky	90	76	11,261,350	9,696,390	38.9	33.0	17.9	14.0
Maryland	------	1	------------	10,000	------	12.5	------	1.2
Missouri	6	6	85,618	73,267	6.1	4.9	2.9	2.5
Montana:								
Bituminous	7	8	30,114	24,474	37.3	42.0	30.9	31.5
Lignite	------	------	------------	------------	------	------	------	------
Total Montana	7	8	30,114	24,474	37.3	42.0	30.9	31.5
New Mexico	1	2	200	395,284	6.5	99.1	.1	58.4
North Dakota (lignite)	17	19	733,461	526,569	28.7	20.4	26.9	19.3
Ohio	30	32	3,711,931	3,601,739	28.7	23.7	11.5	10.6
Oklahoma	4	2	44,500	49,655	16.5	16.8	4.3	4.7
Pennsylvania	88	88	5,865,258	6,016,445	28.5	29.5	9.4	9.2
South Dakota (lignite)	1	1	5,600	7,105	31.5	39.7	31.5	39.7
Tennessee	1	1	800	400	4.9	2.0	------	------
Utah	35	34	2,285,574	2,017,895	60.9	61.0	44.3	47.0
Virginia	35	31	4,327,599	4,368,987	32.3	36.7	14.3	14.8
Washington	1	------	1,233	------------	1.0	------	.6	------
West Virginia	168	182	15,610,182	17,314,930	24.2	23.8	13.8	14.6
Wyoming	12	11	219,432	222,586	16.1	15.5	8.7	8.7
Total	643	638	49,581,563	50,024,098	24.6	23.0	12.3	11.8

THERMAL DRYING

Because most of the bituminous coal and lignite produced in the United States is either sprayed with water underground to reduce the dust in mining, cleaned by wet methods, or subjected to wet screening in the tipple, the problem of removing surface moisture is vital. The moisture must be removed for any one or a combination of the following reasons: (1) To avoid freezing difficulties and to facilitate handling the coal during shipment and transfer to the firebox; (2) to reduce the heat wasted in evaporation of surface moisture on the coal, thus increasing efficiency in burning; (3) to decrease transportation costs; (4) to improve the coal so that it may be used for specific purposes, such as producing coke and briquets; and (5) to facilitate drycleaning.

Removal of surface water from fine coal usually presents an individual problem at each preparation plant. Fine coal has a greater surface area per unit weight than coarse coal; therefore, its capacity for retaining moisture is proportionately greater. Removing water from coarse coal is relatively easy, but the problem is greater with coal that is 10 mesh or finer.[6]

The two components of the total moisture content of wetwashed coal are inherent and surface moisture. Inherent moisture is present in the coal in the bed. Surface moisture is attached to the surface of the coal particles or retained in cracks and fissures other than capillary openings in the coal substance.

There are three principal methods of removing surface moisture from coal: (1) Gravity drainage, (2) mechanical dewatering, and (3) thermal drying. Thermal drying is generally used on coals that cannot be readily dried by gravity drainage or mechanical means, such as screens, centrifuges, and filters.

The annual reports of bituminous coal and lignite producers to the Bureau of Mines for 1957 included data on thermal drying for the first time. These and succeeding reports have included data on thermal drying only at the preparation plant and have not included thermal drying at powerplants or other industrial plants.

Thermal driers have been divided into 7 groups: (1) Rotary, (2) screen, (3) vertical tray and cascade, (4) continuous carrier, (5) suspension or flash, (6) fluidized-bed, and (7) multilouvre driers.

Each type of thermal drier has been designed to handle a definite range of sizes of coal. The sizes of coal most commonly reported as thermally dried in 1962 were ¼- by 0-inch and ⅜- by 0-inch. The top sizes reported thermally dried in 1962 ranged from a maximum of 2 inches to a minimum of ⅛-inch. In nine States, mines that operated bituminous coal cleaning plants in 1962 did no thermal drying.

Bituminous coal and lignite thermally dried amounted to 47 million tons, or 11 percent of the total production in the United States.

---

[6] Lyons, Orville R. Dewatering and Thermal Drying. AIME Coal Preparation 1950, pp. 648–715.

TABLE 55.—Thermal drying of bituminous coal and lignite in the United States, by type of drying equipment

Type of drier	Number of thermal drying units		Thermally dried (net tons)		Percentage of total	
	1961	1962	1961	1962	1961	1962
Rotary	11	11	1,007,814	1,998,254	2.5	4.2
Screen	61	56	8,176,355	8,271,683	20.6	17.6
Vertical tray and cascade	64	59	5,574,594	5,856,812	14.1	12.5
Continuous carrier	5	4	813,122	659,950	2.1	1.4
Suspension or flash	[1] 63	58	[1] 13,450,086	8,105,551	[1] 33.9	17.3
Fluidized-bed	(2)	29	(2)	12,432,991	(2)	26.5
Multilouvre	56	49	10,611,069	9,631,349	26.8	20.5
Total	260	266	39,633,040	46,956,590	100.0	100.0

[1] Includes fluidized-bed.
[2] Included with suspension or flash.

TABLE 56.—Comparison of thermal drying of bituminous coal and lignite with mechanical cleaning at mines in the United States, by States

State	Cleaning plants, number				Production mechanically cleaned (net tons)		Thermally dried (net tons)		Percentage of cleaned coal thermally dried	
	Total		With thermal drying							
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
Illinois	55	54	19	21	40,803,492	43,918,398	5,837,195	7,177,923	14.3	16.3
Indiana	17	16	10	10	11,243,883	11,847,002	2,946,874	3,063,153	26.2	25.9
Kentucky	82	77	9	9	40,631,270	41,726,820	1,418,077	2,878,716	3.5	6.9
North Dakota (lignite)	-----	-----	-----	-----	-----------	-----------	-----------	370,000	-----	-----
Ohio	21	20	6	6	14,503,884	13,186,941	2,144,960	1,922,312	14.8	14.6
Pennsylvania	81	91	11	15	38,214,741	40,261,140	3,489,286	4,223,202	9.1	10.5
Utah	6	7	4	4	3,582,470	2,774,284	1,651,295	1,518,269	46.1	54.7
Virginia	22	24	6	3	15,050,255	12,832,402	4,352,731	3,753,008	28.9	29.2
Washington	5	5	2	1	186,622	230,037	102,962	170,507	55.2	74.1
West Virginia	153	153	43	48	84,503,771	88,933,759	17,689,660	21,879,500	20.9	24.6
Other States	61	61	-----	-----	15,990,554	15,921,816	-----------	-----------	-----	-----
Total	503	508	110	117	264,710,942	271,632,599	39,633,040	46,956,590	15.0	17.2

TABLE 57.—Thermal drying of bituminous coal and lignite at mines in the United States, by States

State	Number of thermal drying units		Grand total production (net tons)		Thermally dried (net tons)		Percentage of total production thermally dried	
	1961	1962	1961	1962	1961	1962	1961	1962
Illinois	49	50	45, 245, 563	48, 487, 362	5, 837, 195	7, 177, 923	12. 9	14. 8
Indiana	34	28	15, 106, 175	15, 708, 902	2, 946, 874	3, 063, 153	19. 5	19. 5
Kentucky	14	17	63, 031, 743	69, 212, 019	1, 418, 077	2, 878, 716	2. 2	4. 2
North Dakota (lignite)	------	4	------------	2, 732, 854	------------	370, 000	------	13. 5
Ohio	17	19	32, 225, 502	34, 124, 663	2, 144, 960	1, 922, 312	6. 7	5. 6
Pennsylvania	26	30	62, 652, 095	65, 315, 386	3, 489, 286	4, 223, 202	5. 6	6. 5
Utah	4	4	5, 159, 245	4, 297, 020	1, 651, 295	1, 518, 269	32. 0	35. 3
Virginia	22	20	30, 332, 298	29, 474, 323	4, 352, 731	3, 753, 008	14. 4	12. 7
Washington	3	2	190, 745	234, 957	102, 962	170, 507	54. 0	72. 6
West Virginia	91	92	113, 070, 448	118, 499, 067	17, 689, 660	21, 879, 500	15. 6	18. 5
Other States	------	------	35, 962, 988	34, 062, 772	------------	------------	------	------
Total	260	266	402, 976, 802	422, 149, 325	39, 633, 040	46, 956, 590	9. 8	11. 1

PRODUCTION BY STATES AND COUNTIES

Detailed production and employment statistics are shown in table 58 for each coal-producing county in the United States from which three or more operators submitted reports for 1962. Statistics on counties with less than three reporting producers have been combined with data for "Other counties" to avoid disclosing individual figures, except when the Bureau has been granted permission to publish statistics separately. Production of mines on the border between two States has been credited to the State in which the coal was mined rather than to the State where the tipple was. If the coal was mined in both States, the tonnage was apportioned accordingly.

Bituminous coal and lignite were mined in 25 States and 315 counties. As soft coal is the source of a large part of the economic activity in many counties, the key items pertaining to the industry are published by counties and are useful in analyzing potential markets. These key items are (1) method of shipping the coal, (2) value, (3) number of men working daily, (4) days worked, and (5) tons per man per day.

The most striking fact illustrated by the following table is the wide variation among several counties in the same State, not only in production but also in average value and average tons per man per day. The differences in average value are due to quality of coal, method of mining, method of transportation, or market conditions. The differences in output per man per day are caused mostly by physical conditions, mining methods, and extent of mechanization.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
ALABAMA									
Bibb	--------------	43,211	--------------	43,211	$5.18	33	122	4,028	10.73
Blount	128,196	2,075	--------------	130,271	5.03	36	286	10,299	12.65
Cullman	4,450	5,400	--------------	9,850	5.92	17	101	1,716	5.74
Jackson	--------------	15,050	--------------	15,050	6.94	30	100	3,010	5.00
Jefferson	6,534,143	274,589	2,819	6,811,551	7.85	3,846	199	766,943	8.88
Marion	89,666	154,154	--------------	243,820	4.01	402	183	73,521	3.32
Shelby	470,409	63,326	--------------	533,735	8.68	261	236	61,703	8.65
Tuscaloosa	621,641	70,250	1,240	693,131	4.70	240	174	41,862	16.55
Walker	3,263,615	139,143	867,760	4,270,518	7.31	1,064	208	221,795	19.25
Winston	60,000	68,523	--------------	128,523	4.69	32	200	6,426	20.00
Total Alabama	11,172,120	835,721	871,819	12,879,660	7.39	5,961	200	1,191,303	10.81
ALASKA									
Total Alaska	850,751	3,216	17,412	871,379	7.35	156	302	47,051	18.52
ARKANSAS									
Franklin	87,180	--------------	--------------	87,180	6.61	17	242	4,106	21.23
Johnson	110,086	2,153	--------------	112,239	7.21	78	179	13,991	8.02
Logan	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Pope	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sebastian	29,091	12,362	--------------	41,453	6.95	70	130	9,130	4.54
Other counties	14,867	--------------	--------------	14,867	9.05	60	51	3,082	4.82
Total Arkansas	241,224	14,515	--------------	255,739	7.07	225	135	30,309	8.44

COLORADO

Delta	32,808	31,938	725	65,471	5.41	50	162	8,113	8.07
El Paso	-----	2,286	-----	2,286	6.56	2	140	280	8.16
Fremont	10,673	320,643	54	331,370	3.71	162	164	26,497	12.51
Garfield	-----	10,698	-----	10,698	7.32	16	168	2,688	3.98
Gunnison	142,969	49,458	2,594	195,021	6.57	196	183	35,915	5.43
Huerfano	5,384	38,449	-----	43,833	5.51	57	156	8,873	4.94
La Plata	4,971	25,019	18	30,008	3.64	27	157	4,232	7.09
Las Animas	654,345	25,580	982	680,907	9.47	518	179	92,767	7.34
Mesa	-----	13,412	98,844	112,256	5.41	65	194	12,585	8.92
Moffat	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Montrose	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Pitkin	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Rio Blanco	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Routt	448,947	37,406	543	486,896	3.80	118	184	21,668	22.47
Weld	478,140	300,880	7,437	786,457	4.17	247	204	50,414	15.60
Other counties	506,992	127,190	15	634,197	7.10	239	194	46,312	13.69
Total Colorado	2,285,229	982,959	111,212	3,379,400	5.92	1,697	183	310,344	10.89

GEORGIA

Walker	-----	7,830	-----	7,830	3.53	21	213	4,474	1.75

ILLINOIS

Adams	-----	42,735	169	42,904	6.98	16	159	2,540	16.89
Bureau	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Christian	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Douglas	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Franklin	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Fulton	4,749,205	367,565	11,633	5,128,403	4.06	756	251	189,871	27.01
Gallatin	55,219	18,414	-----	73,633	3.36	39	220	8,602	8.56
Greene	-----	4,303	205	4,508	5.43	2	240	480	9.39
Grundy	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Henry	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Jackson	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Jefferson	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Kankakee	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Knox	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Logan	-----	20,522	30	20,552	5.00	18	158	2,835	7.25
Macoupin	255,827	59,371	2,898	318,096	4.06	159	175	27,879	11.41
Madison	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Marion	9,555	4,988	2,015	16,558	3.75	31	109	3,365	4.92
Menard	-----	7,657	-----	7,657	6.04	10	153	1,531	5.00
Mercer	52,015	16,169	550	68,734	3.00	23	259	5,958	11.53

See footnotes at end of table.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
				ILLINOIS—Continued					
Montgomery	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Peoria	714,321	344,283	817	1,059,421	$4.96	176	181	31,865	33.25
Perry	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Randolph	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
St. Clair	3,151,493	1,648,014	2,386	4,801,893	3.59	469	264	123,789	38.79
Saline	3,456,485	26,544	7,553	3,490,582	3.80	757	235	178,150	19.59
Sangamon	------------	81,907	------------	81,907	5.00	44	174	7,641	10.72
Schuyler	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Stark	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Vermilion	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Wabash	------------	2,583	------------	2,583	4.13	2	155	310	8.33
Washington	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Will	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Williamson	5,488,768	265,801	27,324	5,781,893	3.80	1,267	231	292,881	19.74
Other counties	24,928,343	2,573,879	85,816	27,588,038	3.83	4,723	231	1,088,827	25.34
Total Illinois	42,861,231	5,484,735	141,396	48,487,362	3.86	8,492	232	1,966,524	24.66
				INDIANA					
Clay	815,183	371,564	2,847	1,189,594	3.66	172	256	44,045	27.01
Daviess	8,183	36,274	------------	44,457	4.58	16	185	2,960	15.02
Dubois	------------	15,133	------------	15,133	4.00	13	201	2,618	5.78
Fountain	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Gibson	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Greene	1,543,623	83,540	5,850	1,633,013	3.81	231	250	57,798	28.25
Knox	86,111	36,793	375	123,279	4.08	133	149	19,756	6.24
Owen	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Parke	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Pike	1,583,940	144,112	2,645	1,730,697	3.71	251	276	69,354	24.95
Spencer	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sullivan	1,389,489	237,339	2,331	1,629,159	4.10	517	238	123,166	13.23
Vermillion	------------	12,094	------------	12,094	6.26	43	66	2,852	4.24
Vigo	926,610	472,627	714,150	2,113,387	4.17	563	240	135,377	15.61
Warrick	5,877,075	289,869	2,834	6,169.778	3.61	628	225	141,454	43.62
Other counties	798,353	215,578	34,380	1,048,311	4.28	410	186	76,277	13.74
Total Indiana	13,028,567	1,914,923	765,412	15,708,902	3.82	2,977	227	675,657	23.25

IOWA

Appanoose	4,311	43,513	650	48,474	5.46	135	129	17,437	2.78
Lucas	23,933	15,858	35	39,826	4.51	18	271	4,885	8.15
Mahaska	224,802	60,227	------------	285,029	3.39	74	272	20,101	14.18
Marion	486,082	157,939	427	644,448	3.40	285	124	35,268	18.27
Monroe	24,254	11,996	------------	36,250	3.16	29	129	3,742	9.69
Van Buren	------------	18,418	15	18,433	5.19	8	180	1,440	12.80
Wapello	------------	57,104	------------	57,104	3.77	16	257	4,105	13.91
Total Iowa	763,382	365,055	1,127	1,129,564	3.56	565	154	86,978	12.99

KANSAS

Bourbon	------------	2,339	------------	2,339	4.25	3	150	450	5.20
Cherokee	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Coffey	------------	1,621	------------	1,621	4.64	2	150	300	5.40
Crawford	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Osage	------------	3,205	34	3,239	5.70	14	111	1,557	2.08
Other counties	725,329	178,184	4,287	907,800	4.64	214	236	50,575	17.95
Total Kansas	725,329	185,349	4,321	914,999	4.64	233	227	52,882	17.30

KENTUCKY

Eastern Kentucky:									
Bell	829,673	1,018,121	574	1,848,368	3.96	826	139	115,179	16.05
Boyd	------------	54,197	1,952	56,149	2.81	51	135	6,879	8.16
Breathitt	463,267	138,600	654	602,521	5.83	253	202	51,104	11.79
Carter	------------	24,432	------------	24,432	5.00	36	122	4,394	5.56
Clay	477,236	585,427	2,728	1,065,391	3.83	994	172	170,721	6.24
Clinton	------------	5,301	------------	5,301	4.77	14	105	1,468	3.61
Elliott	------------	15,989	------------	15,989	3.44	19	191	3,636	4.40
Floyd	3,242,860	496,522	7,306	3,746,688	5.48	1,863	185	345,321	10.85
Harlan	5,221,944	296,081	10,140	5,528,165	5.20	2,673	185	494,716	11.17
Jackson	15,000	12,369	------------	27,369	4.98	78	77	6,021	4.55
Johnson	137,810	42,182	------------	179,992	3.35	253	83	21,027	8.56
Knott	1,871,031	97,605	------------	1,968,636	3.17	1,209	124	150,084	13.12
Knox	177,277	102,516	100	279,893	3.34	157	140	22,016	12.71
Laurel	92,152	15,134	------------	107,286	3.54	76	97	7,380	14.54
Lawrence	------------	16,793	------------	16,793	4.04	23	138	3,165	5.31
Lee	15,429	28,890	5,570	49,889	4.06	57	174	9,938	5.02
Leslie	1,420,572	383,635	963	1,805,170	3.84	925	200	184,956	9.76
Letcher	4,616,274	436,746	11,102	5,064,122	5.01	2,111	186	392,430	12.90
McCreary	323,435	36,887	------------	360,322	3.52	209	192	40,203	8.96
Magoffin	40,219	4,200	------------	44,419	3.00	59	150	8,884	5.00

See footnotes at end of table.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
KENTUCKY—Continued									
Eastern Kentucky—Continued									
Martin	67,150	1,400		68,550	$4.56	49	200	9,793	7.00
Morgan		39,611		39,611	4.00	7	141	990	40.00
Owsley		2,400		2,400	4.56	6	100	600	4.00
Perry	3,208,751	261,967	3,432	3,474,150	4.18	1,580	180	284,230	12.22
Pike	8,288,966	1,644,739	12,712	9,946,417	3.78	4,386	173	757,041	13.14
Pulaski	69,275	19,025		88,300	4.37	46	188	8,653	10.20
Rockcastle	2,000	8,000		10,000	3.30	20	110	2,201	4.54
Wayne		1,800		1,800	4.51	5	90	450	4.00
Whitley	626,718	91,688	65	718,471	3.83	350	168	58,660	12.25
Wolfe		10,548		10,548	5.00	21	123	2,573	4.10
Total Eastern Kentucky	31,207,039	5,892,805	57,298	37,157,142	4.38	18,356	172	3,164,713	11.74
Western Kentucky:									
Butler	42,028	141,519		183,547	4.16	69	192	13,230	13.87
Christian	69,799			69,799	5.19	18	282	5,076	13.75
Daviess	903,497	158,553		1,062,050	2.61	98	275	26,952	39.41
Grayson		1,600		1,600	3.48	3	50	160	10.00
Hancock	3,205			3,205	3.48	3	100	321	10.00
Henderson	12,690	263,438	1,981	278,109	2.96	119	197	23,410	11.88
Hopkins	10,007,644	321,711	953	10,330,308	3.50	2,032	233	472,893	21.84
McLean	59,184	14,454		73,638	2.87	37	100	3,682	20.00
Muhlenberg	13,214,175	432,242	340	13,646,757	3.28	1,379	256	352,505	38.71
Ohio	3,206,739	31,925		3,238,664	3.31	286	261	74,567	43.43
Union	2,554,267	9,272	363	2,563,902	3.94	598	230	137,475	18.65
Webster	580,232	23,066		603,298	2.72	78	227	17,726	34.03
Total Western Kentucky	30,653,460	1,397,780	3,637	32,054,877	3.38	4,720	239	1,127,997	28.42
Total Kentucky	61,860,499	7,290,585	60,935	69,212,019	3.91	23,076	186	4,292,710	16.12
MARYLAND									
Allegany	39,745	121,667		161,412	4.48	166	153	25,385	6.36
Garrett	370,699	288,495	15	659,209	3.71	308	184	56,703	11.63
Total Maryland	410,444	410,162	15	820,621	3.86	474	173	82,088	10.00

MISSOURI

Adair	----------	32,261	1,874	34,135	4.90	57	146	8,305	4.11
Barton	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Boone	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Callaway	----------	107,929	----------	107,929	4.16	42	259	10,858	9.94
Clark	----------	12,453	----------	12,453	5.50	7	199	1,391	8.95
Dade	----------	18,000	----------	18,000	4.69	10	285	2,848	6.32
Henry	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Lafayette	----------	6,740	146	6,886	7.51	39	150	5,836	1.18
Macon	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Putnam	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Randolph	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
St. Clair	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Vernon	40,550	15,772	26	56,348	4.09	26	162	4,205	13.40
Other counties	1,772,524	230,665	657,027	2,660,216	4.14	462	243	112,280	23.69
Total Missouri	1,813,074	423,820	659,073	2,895,967	4.16	643	227	145,723	19.87

MONTANA

Bituminous coal:									
Blaine	----------	3,350	100	3,450	8.00	7	117	818	4.22
Carbon	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Cascade	----------	1,444	----------	1,444	6.68	3	78	234	6.18
Musselshell	23,731	34,625	50	58,406	6.77	58	146	8,465	6.90
Rosebud	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Other counties	2,543	11,764	56	14,363	7.18	19	158	3,004	4.78
Total bituminous coal	26,274	51,183	206	77,663	6.90	87	144	12,521	6.20
Lignite:									
Custer	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Richland	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sheridan	----------	4,781	----------	4,781	3.91	5	178	889	5.38
Other counties	295,360	4,355	----------	299,715	1.72	26	176	4,563	65.68
Total lignite	295,360	9,136	----------	304,496	1.99	31	176	5,452	55.85
Total Montana	321,634	60,319	206	382,159	2.98	118	152	17,973	21.26

See footnotes at end of table.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
NEW MEXICO									
Colfax	251,402	4,978	268	256,648	$5.11	239	107	25,537	10.05
McKinley	396,715	13,384	------------	410,099	2.97	64	198	12,650	32.42
Rio Arriba	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sandoval	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
San Juan	------------	3,658	------------	3,658	5.60	11	136	1,505	2.43
Other counties	1,916	4,836	------------	6,752	6.49	11	96	1,052	6.42
Total New Mexico	650,033	26,856	268	677,157	3.83	325	125	40,744	16.62
NORTH DAKOTA (LIGNITE)									
Adams	9,552	11,294	------------	20,846	2.62	6	180	1,080	19.30
Bowman	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Burke	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Burleigh	------------	10,734	------------	10,734	3.32	1	140	140	76.67
Divide	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Dunn	------------	3,959	------------	3,959	2.92	6	91	548	7.22
Grant	------------	23,841	------------	23,841	3.03	8	89	709	33.62
Hettinger	------------	2,580	------------	2,580	3.70	2	86	171	15.09
McLean	33,794	50,674	100	84,568	3.19	18	171	3,079	27.47
Mercer	914,082	27,249	101,144	1,042,475	2.14	91	206	18,706	55.73
Morton	------------	18,674	------------	18,674	2.50	9	125	1,129	16.54
Mountrail	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Oliver	------------	11,612	------------	11,612	2.50	8	95	763	15.22
Stark	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Ward	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Williams	------------	2,059	------------	2,059	4.70	3	70	209	9.85
Other counties	970,509	279,606	261,391	1,511,506	2.23	163	236	38,453	39.31
Total North Dakota	1,927,937	442,282	362,635	2,732,854	2.24	315	206	64,987	42.05

OHIO

Athens	44, 890	197, 628	1, 278	243, 796	4. 70	157	166	26, 022	9. 37
Belmont	6, 180, 395	404, 220	27, 940	6, 612, 555	4. 09	1, 645	218	357, 975	18. 47
Carroll	60, 507	290, 384	2, 420	353, 311	3. 35	138	191	26, 308	13. 43
Columbiana	87, 856	1, 040, 481	402	1, 128, 739	3. 27	248	262	64, 859	17. 40
Coshocton	193, 766	692, 778	929, 033	1, 815, 577	4. 17	397	221	87, 638	20. 72
Gallia	697, 518	61, 797	467	759, 782	3. 28	230	234	53, 884	14. 10
Guernsey	245, 067	33, 235	21	278, 323	3. 40	105	219	22, 993	12. 10
Harrison	5, 831, 980	750, 523	1, 243, 639	7, 826, 142	4. 04	1, 795	217	389, 253	20. 11
Hocking	4, 594	63, 816	----------	68, 410	4. 09	45	109	4, 883	14. 01
Holmes	73, 002	169, 589	----------	242, 591	3. 23	39	234	9, 111	26. 63
Jackson	27, 247	273, 511	----------	300, 758	3. 99	124	235	29, 193	10. 30
Jefferson	1, 862, 249	1, 416, 158	11, 173	3, 289, 580	3. 47	880	223	196, 259	16. 76
Lawrence	49, 975	323, 198	10, 000	383, 173	3. 76	58	248	14, 400	26. 61
Mahoning	----------	1, 047, 841	1, 974	1, 049, 815	3. 88	238	258	61, 285	17. 13
Meigs	7, 443	250, 878	----------	258, 321	2. 85	120	157	18, 818	13. 73
Morgan	----------	17, 574	2, 205, 131	2, 222, 705	3. 18	246	244	59, 992	37. 05
Muskingum	----------	274, 383	----------	274, 383	3. 06	85	217	18, 408	14. 91
Noble	573, 299	837, 286	----------	1, 410, 585	2. 67	166	186	30, 888	45. 67
Perry	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Portage	----------	92, 277	2, 673	94, 950	3. 67	22	321	7, 065	13. 44
Stark	----------	639, 411	18, 955	658, 366	3. 18	155	281	43, 629	15. 09
Tuscarawas	331, 158	2, 105, 853	4, 852	2, 441, 863	3. 53	724	248	179, 899	13. 57
Vinton	14, 469	86, 585	----------	101, 054	4. 11	110	163	17, 936	5. 63
Washington	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Wayne	----------	50, 619	----------	50, 619	3. 19	27	234	6, 319	8. 01
Other counties	1, 291, 267	967, 998	----------	2, 259, 265	3. 61	345	237	81, 763	27. 63
Total Ohio	17, 576, 682	12, 088, 023	4, 459, 958	34, 124, 663	3. 72	8, 099	223	1, 808, 780	18. 87

OKLAHOMA

Craig	197, 880	66, 606	----------	264, 486	3. 51	81	252	20, 376	12. 98
Haskell	372, 188	----------	----------	372, 188	7. 27	106	164	17, 368	21. 43
Le Flore	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
McIntosh	----------	1, 183	----------	1, 183	5. 29	2	132	264	4. 48
Okmulgee	----------	1, 739	----------	1, 739	4. 05	2	150	300	5. 80
Pittsburg	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Rogers	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sequoyah	16, 898	----------	----------	16, 898	7. 84	13	23	304	55. 58
Other counties	385, 234	6, 089	231	391, 554	8. 17	313	195	61, 162	6. 40
Total Oklahoma	972, 200	75, 617	231	1, 048, 048	6. 66	517	193	99, 774	10. 50

See footnotes at end of table.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
PENNSYLVANIA									
Allegheny	3,481,865	1,112,735	248,254	4,842,854	$5.06	1,977	189	372,794	12.99
Armstrong	2,338,749	1,060,029	125,468	3,524,246	4.55	1,079	199	215,006	16.39
Beaver	16,499	617,117	--------	633,616	3.25	146	249	36,305	17.45
Bedford	--------	354,457	--------	354,457	3.50	143	224	32,005	11.08
Blair	55,036	23,371	--------	78,407	4.08	40	243	9,730	8.06
Bradford	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Butler	1,076,064	1,149,412	1,311	2,226,787	3.58	560	213	119,118	18.69
Cambria	5,036,405	398,940	449,321	5,884,666	5.82	3,812	168	639,328	9.20
Cameron	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Centre	199,626	529,333	8	728,967	3.79	285	247	70,272	10.37
Clarion	2,572,393	910,003	9,423	3,491,819	3.48	741	260	192,330	18.16
Clearfield	5,791,574	797,837	11,880	6,601,291	3.72	2,164	219	474,871	13.90
Clinton	373,858	32,840	--------	406,698	3.72	82	255	20,879	19.48
Elk	185,588	271,640	57	457,285	3.69	181	212	38,434	11.90
Fayette	945,564	333,275	13,881	1,292,720	4.71	1,140	194	221,035	5.85
Greene	9,029,775	78,540	20,138	9,128,453	6.25	3,831	200	767,557	11.89
Huntingdon	--------	30,451	--------	30,451	4.03	36	140	5,024	6.06
Indiana	4,098,343	629,209	94,691	4,822,243	4.85	1,971	205	403,225	11.96
Jefferson	1,268,363	111,506	2,337	1,382,206	3.47	563	205	115,414	11.98
Lawrence	16,556	634,342	--------	650,898	3.02	243	189	45,902	14.18
Lycoming	--------	38,705	--------	38,705	3.24	21	145	3,039	12.74
Mercer	568,456	555,968	106	1,124,530	3.77	188	289	54,371	20.68
Somerset	1,965,637	439,578	4,632	2,409,847	3.98	1,273	166	211,777	11.38
Tioga	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Venango	1,820	293,551	--------	295,371	3.16	69	192	13,216	22.35
Washington	9,215,061	1,597,752	113,631	10,926,444	6.39	4,051	210	849,110	12.87
Westmoreland	2,583,834	546,421	439,342	3,569,597	5.31	1,511	205	309,354	11.54
Other counties	53,310	359,477	41	412,828	4.15	102	245	24,977	16.53
Total Pennsylvania	50,874,376	12,906,489	1,534,521	65,315,386	5.07	26,209	200	5,245,073	12.45
SOUTH DAKOTA (LIGNITE)									
Dewey	--------	17,914	--------	17,914	4.30	8	189	1,513	11.84

TENNESSEE									
Anderson	954,275	634,840	26	1,589,141	3.74	550	180	98,828	16.08
Bledsoe	12,639	8,255	----	20,894	3.47	48	118	5,678	3.68
Campbell	969,831	367,146	----	1,336,977	3.45	680	147	99,824	13.39
Claiborne	342,912	37,825	----	380,737	3.38	199	113	22,417	16.98
Cumberland	20,335	14,229	----	34,564	4.00	30	191	5,742	6.02
Fentress	82,866	9,158	----	92,024	3.00	302	108	32,633	2.82
Grundy	146,210	45,952	----	192,162	4.14	45	214	9,611	19.99
Hamilton	2,100	29,678	----	31,778	3.41	44	139	6,122	5.19
Marion	524,905	117,755	171	642,831	4.37	701	104	72,690	8.84
Morgan	43,300	272,566	2,125	317,991	3.47	498	212	105,803	3.01
Overton	69,335	5,607	----	74,942	2.78	149	127	18,973	3.95
Pickett	----	4,000	----	4,000	4.00	8	50	400	10.00
Putnam	454,468	30,220	630	485,318	3.85	106	237	25,146	19.30
Rhea	----	27,656	----	27,656	3.39	40	104	4,146	6.67
Scott	391,667	92,793	30	484,490	3.07	206	156	32,186	15.05
Sequatchie	245,489	43,304	----	288,793	3.25	474	111	52,603	5.49
Van Buren	194,899	14,414	----	209,313	3.79	100	121	12,065	17.35
Total Tennessee	4,455,231	1,755,398	2,982	6,213,611	3.63	4,180	145	604,867	10.27
UTAH									
Carbon	2,922,808	165,594	16,725	3,105,127	5.64	1,512	163	246,439	12.60
Emery	894,175	172,265	10,809	1,077,249	4.71	477	183	87,227	12.35
Iron	----	45,742	----	45,742	4.72	21	243	5,099	8.97
Sevier	----	49,393	----	49,393	6.29	12	239	2,870	17.21
Summit	----	19,509	----	19,509	4.46	12	239	2,873	6.79
Total Utah	3,816,983	452,503	27,534	4,297,020	5.40	2,034	169	344,508	12.47
VIRGINIA									
Buchanan	9,911,936	2,083,027	1,947	11,996,910	3.77	6,714	201	1,346,244	8.91
Dickenson	7,742,246	613,867	16	8,356,129	4.20	2,245	222	499,200	16.74
Lee	280,981	172,201	----	453,182	3.68	445	146	64,839	6.99
Montgomery	----	11,008	----	11,008	3.91	19	120	2,279	4.83
Russell	1,732,618	290,906	----	2,023,524	4.68	749	219	164,346	12.31
Scott	8,500	3,744	----	12,244	4.97	19	138	2,616	4.68
Tazewell	411,967	48,215	----	460,182	3.26	248	215	53,209	8.64
Wise	5,037,460	843,395	280,289	6,161,144	3.98	2,568	222	571,047	10.79
Total Virginia	25,125,708	4,066,363	282,252	29,474,323	3.99	13,007	208	2,703,780	10.90

See footnotes at end of table.

TABLE 58.—Production, value, men working daily, days active, man-days, and output per man per day at bituminous coal and lignite mines in the United States, 1962, by States and counties—Continued

County	Production (net tons)				Average value per ton [3]	Average number of men working daily	Average number of days worked	Number of man-days worked	Average tons per man per day [4]
	Shipped by rail or water [1]	Shipped by truck	Used at mine [2]	Total					
WASHINGTON									
King	14, 513	36, 669	--------	51, 182	$8. 90	51	166	8, 446	6. 06
Kittitas	159, 143	7, 280	4, 084	170, 507	6. 32	139	240	33, 315	5. 12
Lewis	--------	3, 500	--------	3, 500	8. 06	3	77	231	15. 15
Thurston	--------	9, 768	--------	9, 768	7. 00	6	248	1, 489	6. 56
Total Washington	173, 656	57, 217	4, 084	234, 957	6. 94	199	218	43, 481	5. 40
WEST VIRGINIA									
Barbour	3, 052, 487	1, 704	--------	3, 054, 191	4. 32	1, 025	192	197, 250	15. 48
Boone	5, 767, 289	158, 560	8, 282	5, 934, 131	4. 54	2, 004	190	381, 089	15. 57
Braxton	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Brooke	155, 666	205, 796	372, 548	734, 010	3. 61	265	202	53. 529	13. 71
Clay	814, 374	7, 606	4, 855	826, 835	4. 56	328	210	68, 799	12. 02
Fayette	4, 566, 524	222, 024	6, 945	4, 795, 493	4. 66	2, 578	189	487, 549	9. 84
Gilmer	1, 025, 330	--------	--------	1, 025, 330	4. 23	316	208	65, 668	15. 61
Grant	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Greenbrier	403, 162	50, 195	453	453, 810	4. 30	342	163	55. 810	8. 13
Harrison	6, 419, 379	52, 908	170	6, 472, 457	4. 20	1, 982	185	366, 248	17. 67
Kanawha	10, 403, 564	163, 521	16, 409	10, 583, 494	4. 17	3, 167	202	640, 441	16. 53
Lewis	284, 093	--------	11, 441	295. 534	3. 32	112	185	20, 677	14. 29
Lincoln	32, 900	--------	--------	32, 900	2. 22	21	78	1, 648	19. 96
Logan	15, 468, 211	45, 722	13, 374	15, 527, 307	4. 35	5, 041	223	1, 122, 073	13. 84
Marion	9, 100, 167	36, 554	13, 634	9, 150, 355	5. 34	2, 549	208	530, 694	17. 24
Marshall	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Mason	256, 560	197, 034	563	454, 157	3. 20	206	221	45, 423	10. 00
McDowell	13, 167, 778	488, 005	106, 396	13, 762, 179	6. 42	5, 629	194	1, 092, 215	12. 60
Mercer	908, 248	46, 666	4, 539	959, 453	6. 26	691	136	93, 883	10. 22
Mineral	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Mingo	5, 225, 388	115, 347	91, 557	5, 432, 292	4. 93	1, 964	188	369, 968	14. 68
Monongalia	5, 625, 860	194, 322	--------	5, 820, 182	4. 84	1, 266	223	281, 730	20. 66
Nicholas	5, 576, 680	180, 337	10, 747	5, 767, 764	4. 96	2, 611	200	522, 379	11. 04
Ohio	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Pocahontas	360, 100	25, 453	--------	385, 553	3. 65	180	159	28, 591	13. 49
Preston	2, 305, 136	693, 187	112	2, 998, 435	3. 68	1, 405	218	305, 715	9. 81
Putnam	--------	74, 731	--------	74, 731	4. 96	41	186	7, 629	9. 80

Raleigh	5, 882, 379	415, 211	23, 045	6, 320, 635	5. 50	3, 117	192	598, 703	10. 56
Randolph	593, 606	123, 117	2, 891	719, 614	4. 12	524	158	82, 637	8. 71
Taylor	435, 009	8, 509	6, 070	449, 588	3. 18	178	147	26, 210	17. 15
Tucker	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Upshur	1, 150, 941	24, 934	-----	1, 175, 875	4. 31	405	210	85, 236	13. 80
Wayne	53, 903	8, 250	-----	62, 153	4. 44	66	214	14, 126	4. 40
Webster	732, 111	39, 517	564	772, 192	4. 35	524	174	91, 246	8. 46
Wyoming	9, 769, 197	434, 384	30, 698	10, 234, 279	5. 43	4, 083	206	841, 301	12. 16
Other counties	2, 318, 425	158, 590	1, 747, 123	4, 224, 138	4. 42	1, 143	223	254, 843	16. 58
Total West Virginia	111, 854, 467	4, 172, 184	2, 472, 416	118, 499, 067	4. 88	43, 763	200	8, 733, 310	13. 57

WYOMING

Campbell	398, 167	22, 510	62, 104	482, 781	1. 30	34	262	8, 919	54. 13
Carbon	462, 842	-----	24	462, 866	2. 45	61	258	15, 733	29. 42
Converse	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Hot Springs	3, 835	7, 614	-----	11, 449	8. 78	19	131	2, 484	4. 61
Lincoln	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Sheridan	341, 196	15, 440	-----	356, 636	3. 36	36	246	8, 867	40. 22
Sweetwater	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Other counties	467, 229	767, 510	20, 253	1, 254, 992	4. 09	378	125	47, 427	26. 46
Total Wyoming	1, 673, 269	813, 074	82, 381	2, 568, 724	3. 20	528	158	83, 430	30. 79

UNITED STATES

Total United States	355, 434, 026	54, 853, 109	11, 862, 190	422, 149, 325	4. 48	143, 822	199	28, 678, 263	14. 72

---

[1] Includes coal loaded at mine directly into railroad cars or river barges, hauled by trucks to railroad sidings, and hauled by trucks to waterways.

[2] Includes coal used at mine for power and heat, made into beehive coke at mine, used by mine employees, all other uses at mine, taken by locomotive tender, and transported from mine to point of use by conveyor, tram, or pipeline.

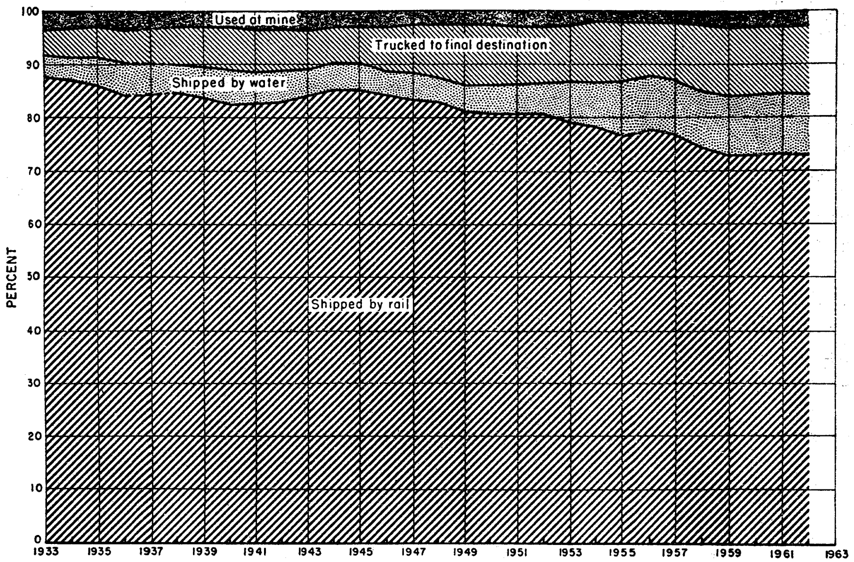
[3] Value received or charged for coal f.o.b. mine. Includes a value for coal not sold but used by producers, such as mine fuel and coal coked, as estimated by producers at average prices that might have been received if such coal had been sold commercially.

[4] In certain counties the average tons per man per day is large owing to auger mining, strip mining, or mechanical loading underground.

[5] Included in "Other counties" to avoid disclosing individual operations.

TRANSPORTATION

Within recent years, methods of shipping bituminous coal and lignite from the mines have changed radically; shipments by rail have declined, and shipments by water and truck have increased. Usually, shipments by water or truck (particularly for short distances) cost less than rail freight rates. See figure 13.



1937 data not available

FIGURE 13.—Percentage of total production of bituminous coal and lignite, 1933–62, by method of shipment from mines, and percentage used at mines.

TABLE 59.—Bituminous coal and lignite shipped from mines, by method of shipment, and that used at mines in the United States

Year	Method of shipment from mines			Used at mine [1]	Total production
	Shipped by rail and trucked to rail	Shipped by water and trucked to water	Trucked to final destination		
	THOUSAND NET TONS				
1933	293, 258	13, 021	15, 463	11, 888	333, 630
1934	313, 304	15, 128	18, 739	12, 197	359, 368
1935	319, 742	18, 327	21, 960	12, 344	372, 373
1936	370, 763	24, 868	27, 929	15, 528	439, 088
1937	295, 336	16, 903	25, 592	10, 714	348, 545
1938	(2)	(2)	(2)	(2)	445, 531
1939	331, 190	22, 229	29, 534	11, 902	394, 855
1940	380, 388	29, 493	35, 540	15, 350	460, 771
1941	425, 184	30, 240	40, 056	18, 669	514, 149
1942	482, 814	34, 018	45, 154	20, 707	582, 693
1943	495, 863	30, 188	42, 433	21, 693	590, 177
1944	527, 136	31, 518	40, 123	20, 799	619, 576
1945	490, 472	27, 548	41, 477	18, 120	577, 617

See footnotes at end of table.

TABLE 59.—Bituminous coal and lignite shipped from mines, by method of shipment, and that used at mines in the United States—Continued

Year	Method of shipment from mines			Used at mine [1]	Total production
	Shipped by rail and trucked to rail	Shipped by water and trucked to water	Trucked to final destination		
THOUSAND NET TONS—Continued					
1946	450, 615	24, 642	42, 731	15, 934	533, 922
1947	527, 282	29, 803	55, 859	17, 680	630, 624
1948	498, 194	26, 735	58, 260	16, 329	599, 518
1949	356, 602	21, 829	47, 786	11, 651	437, 868
1950	417, 225	27, 583	58, 286	13, 217	516, 311
1951	430, 387	29, 984	58, 132	15, 162	533, 665
1952	375, 911	27, 746	50, 231	12, 953	466, 841
1953	362, 133	35, 648	47, 102	12, 407	457, 290
1954	305, 918	32, 912	44, 689	8, 187	391, 706
1955	355, 924	47, 476	51, 607	9, 626	464, 633
1956	390, 015	50, 732	49, 768	10, 359	500, 874
1957	380, 471	51, 171	50, 334	10, 728	492, 704
1958	305, 642	43, 899	50, 605	10, 300	410, 446
1959	300, 763	45, 954	52, 564	12, 747	412, 028
1960	303, 865	46, 784	52, 699	12, 164	415, 512
1961	293, 546	46, 348	51, 044	12, 039	402, 977
1962	307, 328	48, 106	54, 853	11, 862	422, 149
PERCENTAGE OF TOTAL					
1933	87. 9	3. 9	4. 6	3. 6	100. 0
1934	87. 2	4. 2	5. 2	3. 4	100. 0
1935	85. 9	4. 9	5. 9	3. 3	100. 0
1936	84. 4	5. 7	6. 4	3. 5	100. 0
1937	(2)	(2)	(2)	(2)	100. 0
1938	84. 7	4. 9	7. 3	3. 1	100. 0
1939	83. 9	5. 6	7. 5	3. 0	100. 0
1940	82. 6	6. 4	7. 7	3. 3	100. 0
1941	82. 7	5. 9	7. 8	3. 6	100. 0
1942	82. 9	5. 8	7. 7	3. 6	100. 0
1943	84. 0	5. 1	7. 2	3. 7	100. 0
1944	85. 1	5. 1	6. 5	3. 3	100. 0
1945	84. 9	4. 8	7. 2	3. 1	100. 0
1946	84. 4	4. 6	8. 0	3. 0	100. 0
1947	83. 6	4. 7	8. 9	2. 8	100. 0
1948	83. 1	4. 5	9. 7	2. 7	100. 0
1949	81. 4	5. 0	10. 9	2. 7	100. 0
1950	80. 8	5. 3	11. 3	2. 6	100. 0
1951	80. 7	5. 6	10. 9	2. 8	100. 0
1952	80. 5	5. 9	10. 8	2. 8	100. 0
1953	79. 2	7. 8	10. 3	2. 7	100. 0
1954	78. 1	8. 4	11. 4	2. 1	100. 0
1955	76. 6	10. 2	11. 1	2. 1	100. 0
1956	77. 9	10. 1	9. 9	2. 1	100. 0
1957	77. 2	10. 4	10. 2	2. 2	100. 0
1958	74. 5	10. 7	12. 3	2. 5	100. 0
1959	73. 0	11. 1	12. 8	3. 1	100. 0
1960	73. 1	11. 3	12. 7	2. 9	100. 0
1961	72. 9	11. 5	12. 6	3. 0	100. 0
1962	72. 8	11. 4	13. 0	2. 8	100. 0

---

[1] Includes coal used by mine employees, taken by locomotive tenders at tipples, used at mines for power and heat, transported from mines to point of use by conveyors or trams, made into beehive coke at mines, and all other uses at mines. [2] Data not available.

TABLE 60.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1962, as reported by mine operators

Route	State	By State (net tons)	Total for route (net tons)
RAILROAD			
Alaska	Alaska	850, 751	850, 751
Atchinson, Topeka & Santa Fe	Colorado	6, 673	766, 290
	Illinois	111, 500	
	New Mexico	648, 117	
Baltimore & Ohio	Illinois	329, 215	32, 879, 739
	Indiana	8, 183	
	Maryland	1, 267	
	Ohio	2, 383, 928	
	Pennsylvania	4, 472, 749	
	West Virginia	25, 684, 397	
Bessemer & Lake Erie	Pennsylvania	1, 397, 444	1, 397, 444
Cambria & Indiana	do	1, 753, 205	1, 753, 205
Carbon County	Utah	1, 031, 999	1, 031, 999
Central of Georgia	Alabama	4, 743	4, 743
Chesapeake & Ohio	Kentucky	9, 498, 784	42, 852, 467
	Ohio	38, 325	
	Virginia	27. 611	
	West Virginia	33, 287, 747	
Cheswick & Harmar	Pennsylvania	386, 927	386, 927
Chicago, Burlington & Qunicy	Illinois	5, 454, 922	7, 017, 155
	Iowa	259, 230	
	Missouri	559, 805	
	Wyoming	743, 198	
Chicago & Eastern Illinois	Illinois	1, 423, 889	2, 804, 012
	Indiana	1, 380, 123	
Chicago & Illinois Midland	Illinois	5, 045, 958	5, 045, 958
Chicago, Milwaukee, St. Paul & Pacific	Indiana	1, 783, 879	2, 009, 944
	Montana (bituminous)	23, 731	
	North Dakota (lignite)	202, 334	
Chicago & North Western	Illinois	1, 778, 703	1, 838, 612
	Iowa	59, 909	
Chicago, Rock Island & Pacific	Illinois	1, 106. 907	1, 294, 708
	Iowa	187. 801	
Clinchfield	Kentucky	160, 493	3, 120, 067
	Virginia	2, 959, 574	
Colorado & Southern	Colorado	2, 241	2, 241
Colorado & Wyoming	do	654, 345	654, 345
Denver & Rio Grande Western	do	1, 143, 830	3, 272, 783
	New Mexico	1, 916	
	Utah	2, 127, 037	
Detroit, Toledo & Ironton	Ohio	975	975
Erie-Lackawanna	do	29, 414	53, 210
	Pennsylvania	23, 796	
Great Northern	North Dakota (lignite)	528, 944	528, 944
Gulf, Mobile & Ohio	Alabama	224, 433	854, 418
	Illinois	629, 985	
Illinois Central	do	11, 353, 713	24, 051, 792
	Indiana	44, 100	
	Kentucky	12, 653, 979	
Illinois Terminal	Illinois	255, 827	255, 827
Interstate	Virginia	2, 747, 936	2, 747, 936
Johnstown and Stony Creek	Pennsylvania	63, 490	63, 490
Kansas City Southern	Oklahoma	200, 390	200, 390
Kentucky & Tennessee	Kentucky	323, 435	323, 435
Lake Erie, Franklin & Clarion	Pennsylvania	435, 905	435, 905
Louisville & Nashville	Alabama	1, 750, 485	25, 904, 258
	Kentucky	23, 014, 052	
	Tennessee	1, 134, 982	
	Virginia	4, 739	
Mary Lee	Alabama	873, 835	873, 835
Midland Valley	Arkansas	1, 149	223, 452
	Oklahoma	222, 303	
Missouri-Illinois	Illinois	768, 897	768, 897
Missouri-Kansas-Texas	Kansas	461, 513	1, 441, 970
	Missouri	816, 206	
	Oklahoma	164, 251	
Missouri Pacific	Arkansas	213, 268	5, 046, 195
	Illinois	4, 792, 377	
	Missouri	40, 550	
Monon	Indiana	174, 452	174, 452
Monongahela	Pennsylvania	946. 324	6, 237, 776
	West Virginia	5, 291, 452	
Montour	Pennsylvania	981, 257	981, 257
New York Central (includes coal shipped over Kanawha & Michigan, Kelley's Creek, Toledo & Ohio Central—and Zanesville & Western).	Illinois	5, 058, 836	22, 947, 676
	Indiana	6, 005, 745	
	Ohio	2, 717, 849	
	Pennsylvania	4, 978, 029	
	West Virginia	4, 187, 217	

TABLE 60.—Bituminous coal and lignite loaded for shipment by railroads and waterways in the United States, 1962, as reported by mine operators—Con.

Route	State	By State (net tons)	Total for route (net tons)
RAILROAD—continued			
New York, Chicago & St. Louis	Ohio	5, 001, 034	5, 001, 034
Norfolk & Western	Kentucky	3, 920, 436	54, 605, 699
	Virginia	19, 054, 492	
	West Virginia	31, 630, 771	
Northern Pacific	Montana (bit. & lig.)	297, 903	1, 371, 724
	North Dakota (lignite)	914, 082	
	Washington	159, 739	
Pacific Coast	do	13, 917	13, 917
Pennsylvania	Indiana	1, 811, 472	21, 461, 379
	Ohio	3, 088, 690	
	Pennsylvania	16, 469, 521	
	West Virginia	91, 696	
Pittsburg & Shawmut	Pennsylvania	1, 742, 994	1, 742, 994
Pittsburgh & Lake Erie	do	766, 446	766, 446
Pittsburgh & West Virginia	Ohio	583, 511	586, 543
	West Virginia	3, 032	
St. Louis-San Francisco	Alabama	730. 084	1, 519, 456
	Arkansas	26, 807	
	Kansas	263, 816	
	Missouri	113, 493	
	Oklahoma	385, 256	
Soo Line	North Dakota (lignite)	282. 577	282, 577
Southern	Alabama	2, 906, 191	5, 498, 967
	Indiana	22, 016	
	Kentucky	592, 624	
	Tennessee	1, 646, 780	
	Virginia	331. 356	
Southern Iowa	Iowa	1, 617	1, 617
Tennessee	Tennessee	911, 417	911, 417
Tennessee Central	do	616, 417	616, 417
Tennessee Coal, Iron & Railroad Co	Alabama	1, 969, 014	1, 969, 014
Toledo, Peoria & Western	Illinois	443, 118	443, 118
Union Pacific	Colorado	478. 140	1, 408, 211
	Wyoming	930, 071	
Unity	Pennsylvania	183, 415	183, 415
Utah	Utah	657. 947	657, 947
Wabash	Iowa	254, 825	537, 845
	Missouri	283, 020	
Western Allegheny	Pennsylvania	131, 637	131, 637
Western Maryland	Maryland	409. 177	3, 458, 136
	Pennsylvania	277, 001	
	West Virginia	2, 771. 958	
Woodward Iron Company	Alabama	1, 029, 863	1, 029, 863
Youngstown & Southern	Ohio	28, 647	28, 647
Total railroad shipments		307, 327, 500	307, 327, 500
WATERWAY			
Allegheny River	Pennsylvania	1. 836. 056	1, 836, 056
Black Warrior River	Alabama	1, 612, 779	1, 612, 779
Green River	Kentucky	7, 851, 085	7, 851. 085
Guyandot River	West Virginia	13, 304	13, 304
Illinois River	Illinois	3, 877, 422	3, 877, 422
Inland Water Way	Alabama	70. 693	70, 693
Kanawha River	West Virginia	4, 440, 681	4, 440, 681
Kentucky River	Kentucky	12, 086	12, 086
Monongahela River	Pennsylvania	14, 028, 180	17, 717, 374
	West Virginia	3, 689, 194	
Ohio River	Illinois	429, 962	10, 529, 411
	Indiana	1, 798, 597	
	Kentucky	3, 833, 525	
	Ohio	3, 704, 309	
	West Virginia	763, 018	
Tennessee River	Tennessee	145, 635	145, 635
Total waterway shipments		48, 106, 526	48. 106, 526
Total loaded at mines for shipment by railroads and waterways		355, 434, 026	355, 434, 026
Shipped by truck from mine to final destination		54, 853, 109	54, 853. 109
Used at mine [1]		11. 862, 190	11, 862, 190
Total production, 1962		422, 149, 325	422, 149, 325

---

[1] Includes coal used at mine for power and heat, made into beehive coke at mine, used by mine employees, all other uses at mine, taken by locomotive tender, and transported from mine to point of use by conveyor, tram, or pipeline.

CONSUMPTION

The statistics on consumption of bituminous coal and lignite, by major consumer classes, are based upon complete coverage of all consumers in each class except "Other manufacturing and mining industries" and "Retail deliveries to other consumers." The figures for both categories are based upon a monthly sample approximating 35 percent coverage. A new benchmark representing complete coverage for "Other manufacturing and mining industries" was established for 1954, based upon data from the Census of Manufactures and the Census of Mineral Industries. The new benchmark for "Retail deliveries to other consumers" for 1954 represents the residual tonnage not otherwise accounted for and includes some coal shipped by truck from mine to final destination.

Data for each month are determined by matching plants reporting for the latest month with identical plants reporting the preceding month, calculating the percentage change from the previous month, and applying this percentage change to the published figure for the previous month. The results have been reasonably reliable over a period of years. A detailed analysis of the establishment of the new benchmarks and the revisions in "Cement mills," "Steel and rolling mills," and "Bunker, foreign and lake vessels," is given in Bureau of Mines Weekly Coal Report 2113, March 14, 1958. The total of the classes approximates total consumption and is a much more reliable figure than "calculated" consumption based on production, imports, exports, and changes in stocks, because certain significant items of stocks are not included in yearend stocks. See figure 14.

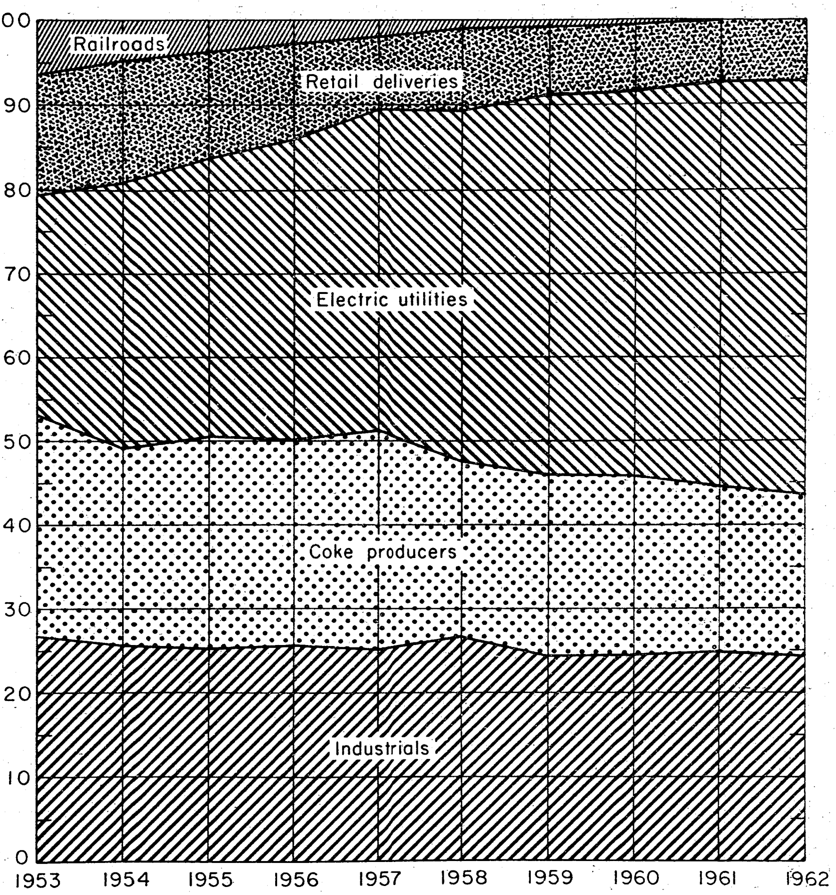


FIGURE 14.—Percentage of total consumption of bituminous coal and lignite, by consumer class, and retail deliveries in the United States, 1953–62.

TABLE 61.—Consumption of bituminous coal and lignite, by consumer class, with retail deliveries in the United States

(Thousand net tons)

Year and month	Electric power utilities[1]	Bunker, foreign and lake vessel[2]	Railroads (class I)[3]	Manufacturing and mining industries					Retail deliveries to other consumers[6]	Total of classes shown[7]
				Beehive coke plants	Oven coke plants	Steel and rolling mills[4]	Cement mills	Other manufacturing and mining industries[5]		
1933	27,088	2,298	72,548	1,408	38,681	14,129	2,760	81,377	77,396	317,685
1934	29,707	2,423	76,037	1,635	44,343	15,391	3,457	87,314	83,507	343,814
1935	30,936	2,683	77,109	1,469	49,046	16,585	3,456	94,598	80,444	356,326
1936	38,104	3,052	86,391	2,698	63,244	19,019	4,711	111,030	80,044	408,293
1937	41,045	3,433	88,080	4,927	69,575	18,148	5,182	124,056	76,331	430,777
1938	36,440	2,310	73,921	1,360	45,266	11,877	4,413	94,196	66,498	336,281
1939	42,304	2,764	79,072	2,298	61,216	13,843	5,194	100,637	68,770	376,098
1940	49,126	2,989	85,130	4,803	76,583	14,169	5,559	107,864	84,687	430,910
1941	59,888	3,304	97,384	10,529	82,609	15,384	6,735	121,880	94,402	492,115
1942	63,472	3,226	115,410	12,876	87,974	14,722	7,462	132,767	102,141	540,050
1943	74,036	3,042	130,283	12,441	90,019	15,864	5,842	142,149	120,121	593,797
1944	76,656	3,069	132,049	10,858	94,438	15,152	3,767	131,498	122,112	589,599
1945	71,603	3,192	125,120	8,135	87,214	14,241	4,203	126,562	119,297	559,567
1946	68,743	2,632	110,166	7,167	76,121	12,151	6,990	117,732	98,684	500,386
1947	86,009	3,087	109,296	10,475	94,325	14,195	7,919	123,928	96,657	545,891
1948	95,620	2,552	94,838	10,322	96,984	14,193	8,546	110,060	86,794	519,909
1949	80,610	2,056	68,123	5,354	85,882	10,529	7,966	96,629	88,389	445,538
1950	88,262	2,042	60,969	9,088	94,757	10,877	7,923	95,862	84,422	454,202
1951	101,898	2,220	54,005	11,418	102,030	11,260	8,507	103,188	74,378	468,904
1952	103,309	1,839	37,962	6,912	90,702	9,632	7,903	93,637	66,861	418,757
1953	112,283	1,839	27,735	8,226	104,648	8,764	8,167	95,160	59,976	426,798
1954	115,235	1,244	17,370	980	84,411	6,983	7,924	77,115	51,798	363,060
1955	140,550	1,499	15,473	2,869	104,508	7,353	8,529	89,611	53,020	423,412
1956	154,983	1,470	12,308	4,043	101,870	7,189	9,026	93,302	48,667	432,858
1957	157,398	1,364	8,401	3,473	104,547	6,938	8,633	87,202	35,712	413,668
1958	152,928	955	3,725	1,017	75,563	7,268	8,256	81,372	35,619	366,703
1959	165,788	969	2,600	1,827	77,354	6,674	8,510	73,396	29,138	366,256
1960	173,882	945	2,101	1,640	79,375	7,378	8,216	76,487	30,405	380,429
1961:										
January	16,903	1	(8)	104	4,949	837	600	7,255	4,069	34,718
February	14,730	--------	(8)	103	4,684	735	492	6,384	3,097	30,225
March	14,773	3	(8)	118	5,223	722	593	6,761	2,273	30,466
April	13,500	45	(8)	109	5,382	645	595	6,234	1,909	28,419
May	13,574	89	(8)	136	6,070	590	663	6,128	1,193	28,443
June	13,722	97	(8)	133	6,019	519	680	5,785	1,010	27,965
July	14,201	99	(8)	123	6,151	472	695	5,490	1,007	28,238
August	15,336	111	(8)	144	6,359	507	642	5,814	1,710	30,623
September	14,797	104	(8)	127	6,498	505	632	5,797	2,173	30,633
October	15,352	103	(8)	138	6,931	561	668	6,754	2,860	33,367
November	15,734	99	(8)	129	6,860	645	657	7,105	2,789	34,018
December	17,007	19	(8)	132	7,259	757	698	7,773	3,645	37,290
Total	179,629	770	(8)	1,496	72,385	7,495	7,615	77,280	27,735	374,405
1962:										
January	17,723	3	(8)	172	7,469	824	587	8,068	4,593	39,439
February	15,443	--------	(8)	158	6,889	754	493	7,197	3,541	34,475
March	16,172	3	(8)	158	7,536	752	591	7,391	3,169	35,772
April	14,137	39	(8)	114	7,064	617	626	6,482	1,794	30,873
May	15,134	92	(8)	96	6,339	525	650	6,216	798	29,850
June	14,987	90	(8)	90	5,384	481	675	5,936	796	28,439
July	15,332	82	(8)	75	5,063	446	679	5,313	947	27,937
August	16,288	91	(8)	84	5,275	493	689	5,696	1,455	30,071
September	14,995	88	(8)	85	5,263	477	677	5,719	2,065	29,369
October	15,968	92	(8)	104	5,473	559	698	6,605	2,464	31,963
November	16,441	85	(8)	108	5,397	639	685	6,770	2,752	32,877
December	18,213	22	(8)	95	5,771	752	669	7,373	3,814	36,709
Total	190,833	687	(8)	1,339	72,923	7,319	7,719	78,766	28,188	387,774

---

[1] Federal Power Commission.

[2] Bureau of the Census, U.S. Department of Commerce. Ore and Coal Exchange.

[3] Association of American Railroads. Represents consumption of bituminous coal and lignite for all uses, including locomotive, powerhouse, shop, and station fuel.

[4] Estimates based upon reports collected from a selected list of representative steel and rolling mills.

[5] Estimates based upon reports collected from a selected list of representative manufacturing plants.

[6] Estimates based upon reports collected from a selected list of representative retailers. Includes some coal shipped by truck from mine to final destination.

[7] The total of classes shown approximates total consumption. The calculation of consumption from production, imports, exports, and changes in stocks is not as accurate as the "Total of classes shown" because certain significant items of stocks are not included in yearend stocks. These items are: Stocks on lake and tidewater docks, stocks at other intermediate storage piles between mine and consumer, and coal in transit.

[8] Canvass discontinued.

TABLE 62.—**Fuel economy in consumption of coal at electric-utility powerplants in the United States**

Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100	Year	Coal consumed per kilowatt-hour (pounds)	Index numbers based on 1919 as 100
1919	3.20	100.0	1934	1.45	45.3	1949	1.24	38.8
1920	3.00	93.8	1935	1.44	45.0	1950	1.19	37.2
1921	2.70	84.4	1936	1.44	45.0	1951	1.14	35.6
1922	2.50	78.1	1937	1.44	45.0	1952	1.10	34.4
1923	2.40	75.0	1938	1.40	43.8	1953	1.06	33.1
1924	2.20	68.8	1939	1.38	43.1	1954	.99	30.9
1925	2.00	62.5	1940	1.34	41.9	1955	.95	29.7
1926	1.90	59.4	1941	1.34	41.9	1956	.94	29.4
1927	1.82	56.9	1942	1.30	40.6	1957	.93	29.1
1928	1.73	54.1	1943	1.30	40.6	1958	.90	28.1
1929	1.66	51.9	1944	1.29	40.3	1959	.89	27.8
1930	1.60	50.0	1945	1.30	40.6	1960	.88	27.5
1931	1.52	47.5	1946	1.29	40.3	1961	.86	26.9
1932	1.49	46.6	1947	1.31	40.9	1962	.86	26.9
1933	1.46	45.6	1948	1.30	40.6			

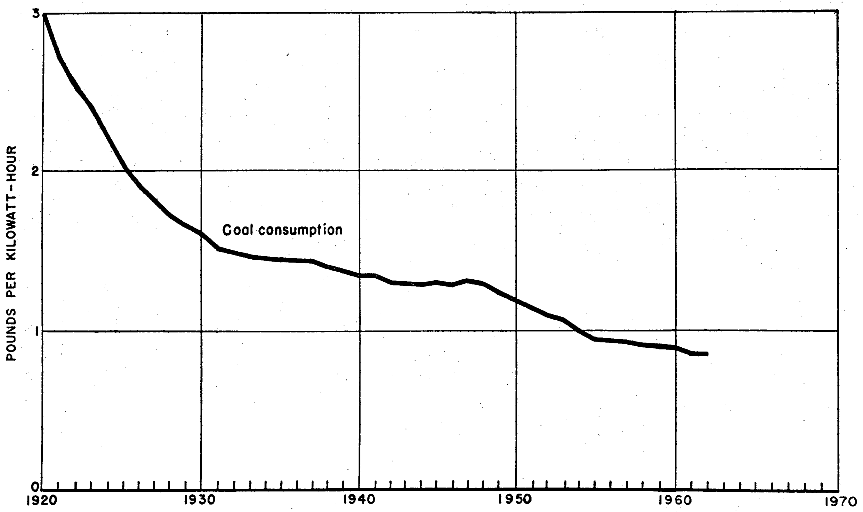


FIGURE 15.—Trend in fuel economy at electric-utility powerplants in the United States, 1920–62.

DISTRIBUTION OF BITUMINOUS COAL AND LIGNITE

Tables 63, 64, and 65 summarize the distribution of bituminous coal and lignite in 1962 for types of consumer use by methods of transportation, coal-producing districts of origin, and geographic divisions and States of destination. This information shows the participation of the bituminous coal and lignite industry in various energy markets of the Nation, both locally and nationally. It also provides benchmarks for special studies and analyses of the many factors that influence coal production and its utilization in the highly competitive energy market.

Table 66 shows, on a comparative basis, the total tons shipped to all types of consumers during the years 1957 through 1962 and what percentage of total shipments during each year moved to each geographic region and State. From these data one can readily determine the size of the total market, the relative position of regional and State markets in relation to the whole, and the trend of shipments to these markets from year to year. The regional and State data reported in this table exclude shipments for United States railroad fuel, vessel fuel, bunker fuel, coal used at mines and sales to employees, overseas exports, and net change in mine inventory, for the reason that the ultimate destinations of these tonnages are not available. Accordingly, this information, where available, is shown in totals at the end of the table.

Table 67 shows the quantitative changes in total tons shipped, expressed in indexes, that took place throughout the country, by geographic division, State of destination, and consumer use, for the years 1957 through 1962. The year 1957 is used as the base year, representing 100. For example, the total shipments of bituminous coal and lignite in the United States in 1957 amounted to 493,895,000 tons. This sum represents 100. Total shipments in 1960 represented only 84.3 percent of the 1957 level, while in 1961 total shipments, compared to 1957, amounted to 81.6 percent. In 1962 they represented 86.0 percent.

To indicate the size of the bituminous coal and lignite market, quantitatively, in each geographic division, State, and consumer use category, the 1957 total tons shipped are shown in the table in lieu of the index numbers of 100 which each tonnage figure represents (except those otherwise noted).

These distribution data are based on reports submitted to the Bureau of Mines voluntarily by producers, sales agents, distributors, and wholesalers who normally produce or sell 100,000 tons or more annually. The unprecedented cooperation of these respondents resulted in their reporting about 94 percent of all coal produced or shipped. To account for total industry shipments, estimates for the remaining shipments are included, based on data from coal trade and other reliable coal statistical reporting agencies.

Details of the distribution survey for calendar year 1962 are shown in Bureau of Mines Mineral Industry Surveys "Bituminous Coal and Lignite Distribution, March 1963," copies of which are available upon request.[7]

---

[7] Obtainable from Publications Distribution Section, Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, Pa. 15213

TABLE 63.—Distribution of bituminous coal and lignite, 1962, by method of movement and consumer use

(Thousand net tons)

Shipments	Electric utilities	Coke and gas plants	Retail dealers	All others	Railroad fuel	Used at mines and sales to employees
Total shipments to all destinations in the United States, Canada, and Mexico, by all methods of movements and consumer use, and overseas exports	193,553	77,395	28,629	95,265	1,724	1,272
Shipments to all destinations in the United States, Canada, and Mexico by specific method of movement and consumer use:						
Method of movement:						
All-rail	92,159	34,412	18,707	59,737	--------	--------
River and ex-river	46,187	22,679	1,041	6,904	--------	--------
Great Lakes [1]	15,960	13,588	4,133	11,773	--------	--------
Tidewater [2]	13,072	5,733	272	1,524	--------	--------
Truck	13,844	375	4,476	15,019	--------	--------
Tramway, conveyor, and private railroad	12,331	608	--------	308	--------	--------
Method of movement and/or consumer uses unknown	--------	--------	--------	--------	1,724	1,272
Total	193,553	77,395	28,629	95,265	1,724	1,272

Shipments	Canadian Great Lakes commercial docks [3]	U.S. Great Lakes dock storage [3]	U.S. tidewater dock storage [3]	Overseas exports [4]	Net change in mine inventory	Total
Total shipments to all destinations in the United States, Canada, and Mexico, by all methods of movement and consumer use, and overseas exports	726	−29	--------	27,041	−949	424,627
Shipments to all destinations in the United States, Canada, and Mexico by specific method of movement and consumer use:						
Method of movement:						
All-rail	--------	--------	--------	--------	--------	205,015
River and ex-river	--------	--------	--------	--------	--------	76,811
Great Lakes [1]	--------	--------	--------	--------	--------	45,454
Tidewater [2]	--------	--------	--------	--------	--------	20,601
Truck	--------	--------	--------	--------	--------	33,714
Tramway, conveyor, and private railroad	--------	--------	--------	--------	--------	13,247
Method of movement and/or consumer uses unknown	726	−29	--------	27,041	−949	29,785
Total	726	−29	--------	27,041	−949	424,627

---

[1] Excludes shipments to Canadian Great Lakes commercial docks and U.S. dock storage for which consumer uses are not available; however, includes vessel fuel, the destinations of which are not available.

[2] Excludes overseas exports and U.S. tidewater dock storage for which consumer uses are not available however, includes bunker fuel, the destinations of which are not available.

[3] Consumer use unknown.

[4] Excludes Canada; consumer use unknown.

TABLE 64.—Distribution of bituminous coal and lignite, 1962, by district of origin and consumer use

(Thousand net tons)

District of origin[1]	Electric utilities	Coke and gas plants	Retail dealers	All others	Railroad fuel	Used at mines and sales to employees
1	16,988	2,614	749	8,112	204	239
2	8,395	19,700	635	7,633	17	30
3 and 6	24,196	6,402	1,076	8,003	159	25
4	21,820	32	1,772	10,480	306	63
7	1,507	13,466	3,216	3,157	67	188
8	37,938	24,380	11,182	28,965	250	557
9	24,879	13	2,384	3,851	74	----------
10	29,667	914	3,820	13.942	364	53
11	9,587	----------	872	5,115	151	37
12	953	----------	38	400	----------	----------
13	8,493	5,560	346	932	2	9
14	----------	619	1	68	----------	----------
15[2]	3,167	193	315	999	54	----------
16	506	----------	96	212	----------	7
17	782	1,602	377	278	----------	2
18	365	----------	14	56	----------	6
19	1,604	----------	180	750	33	5
20	455	1,900	968	948	6	24
21	1,667	----------	460	572	36	19
22 and 23	584	----------	128	792	1	8
Total	193,553	77,395	28,629	95,265	1,724	1,272

District of origin[1]	Canadian Great Lakes commercial docks[3]	U.S. Great Lakes dock storage[3]	U.S. tidewater dock storage[3]	Overseas exports[4]	Net change in mine inventory	Total
1	30	−14	5	1,159	−92	29,994
2	30	13	----------	----------	68	36,521
3 and 6	87	76	8	1,119	−16	41,135
4	223	−175	----------	----------	−124	34,397
7	34	32	−1	11,841	−153	33,354
8	322	49	−12	12,922	−414	116,139
9	----------	6	----------	----------	−36	31,171
10	----------	−17	----------	----------	−151	48,592
11	----------	1	----------	----------	−14	15,749
12	----------	----------	----------	----------	----------	1,391
13	----------	----------	----------	----------	−24	15,318
14	----------	----------	----------	----------	----------	688
15[2]	----------	----------	----------	----------	4	4,732
16	----------	----------	----------	----------	2	823
17	----------	----------	----------	----------	1	3,042
18	----------	----------	----------	----------	----------	441
19	----------	----------	----------	----------	−2	2,570
20	----------	----------	----------	----------	−4	4,297
21	----------	----------	----------	----------	6	2,760
22 and 23	----------	----------	----------	----------	----------	1,513
Total	726	−29	----------	27,041	−949	424,627

---

[1] Producing districts are defined in Bureau of Mines Bituminous Coal and Lignite Distribution Calendar Year 1962, March 1963.

[2] Excludes Texas.

[3] Consumer use unknown.

[4] Excludes Canada; consumer use unknown.

TABLE 65.—Distribution of bituminous coal and lignite, 1962, by destination and consumer use

(Thousand net tons)

Destination	Total	Electric utilities	Coke and gas plants	Retail dealers	All others [1]
New England:					
Massachusetts	4,342	3,067	----------	289	986
Connecticut	4,047	3,265	447	65	270
Maine, New Hampshire, Vermont, and Rhode Island	1,608	893	9	96	610
Middle Atlantic:					
New York	21,737	10,948	3,997	467	6,325
New Jersey	6,901	4,651	440	49	1,761
Pennsylvania	47,469	17,493	19,610	1,023	9,343
East North Central:					
Ohio	48,324	21,918	9,482	3,102	13,822
Indiana	31,824	14,805	9,596	1,928	5,495
Illinois	39,259	20,380	2,874	5,803	10,202
Michigan	27,255	12,276	4,249	2,358	8,372
Wisconsin	12,729	5,371	295	2,765	4,298
West North Central:					
Minnesota	5,768	3,058	632	727	1,351
Iowa	5,047	2,347	----------	801	1,899
Missouri	7,685	4,590	136	923	2,036
North Dakota and South Dakota	2,390	1,429	----------	613	348
Nebraska and Kansas	1,630	794	----------	197	639
South Atlantic:					
Delaware and Maryland	9,884	4,327	4,471	239	847
District of Columbia	813	320	----------	148	345
Virginia	12,823	7,194	32	1,100	4,497
West Virginia	15,272	6,996	3,813	341	4,122
North Carolina	9,980	6,707	----------	881	2,392
South Carolina	3,921	2,027	----------	289	1,605
Georgia and Florida	5,198	4,380	----------	336	482
East South Central:					
Kentucky	11,873	7,958	1,410	644	1,861
Tennessee	14,120	11,144	249	864	1,863
Alabama and Mississippi	16,716	9,760	5,641	302	1,013
West South Central: Arkansas, Louisiana, Oklahoma, and Texas	839	----------	646	46	147
Mountain:					
Colorado	3,340	1,562	932	326	520
Utah	2,417	455	1,365	273	324
Montana and Idaho	1,108	295	----------	480	333
Wyoming	1,438	1,111	----------	60	267
New Mexico	107	30	----------	30	47
Arizona and Nevada	488	335	----------	24	129
Pacific:					
Washington and Oregon	964	----------	----------	287	677
California	1,426	----------	1,381	6	39
Alaska	893	289	----------	76	528
Canada [2]	10,854	1,169	5,042	639	4,004
Mexico	53	----------	----------	----------	53
Destinations not revealable	1,105	209	646	32	218
Destinations and/or consumer uses not available:					
Great Lakes movement:					
Canadian commercial docks	726	----------	----------	----------	----------
Vessel fuel	1,183	----------	----------	----------	----------
U.S. dock storage	−29	----------	----------	----------	----------
Tidewater movement:					
Overseas exports (except Canada)	27,041	----------	----------	----------	----------
Bunker fuel	12	----------	----------	----------	----------
U.S. dock storage	----------	----------	----------	----------	----------
Railroad fuel:					
U.S. companies	1,602	----------	----------	----------	----------
Canadian companies	122	----------	----------	----------	----------
Coal used at mines and sales to employees	1,272	----------	----------	----------	----------
Net change in mine inventory	−949	----------	----------	----------	----------
Total	424,627	----------	----------	----------	----------

[1] Excludes vessel and bunker fuel, the destinations of which are not available.

[2] Excludes shipments to Canadian Great Lakes commercial docks and Canadian railroad companies.

TABLE 66.—Total bituminous coal and lignite shipments and percent of grand total shipments, 1957–1962, by geographic division and State of destination

Geographic division and State of destination	Thousand tons						Percent of total					
	1957	1958	1959	1960	1961	1962	1957	1958	1959	1960	1961	1962
Total	493,895	408,564	412,245	416,119	403,262	424,627	100.0	100.0	100.0	100.0	100.0	100.0
New England	11,909	10,871	11,150	9,313	9,674	9,997	2.4	2.7	2.7	2.2	2.4	2.4
Massachusetts	5,354	4,728	4,924	4,031	4,014	4,342	1.1	1.2	1.2	1.0	1.0	1.0
Connecticut	4,105	4,199	3,850	3,758	3,956	4,047	0.8	1.0	0.9	0.9	1.0	1.0
Maine, New Hampshire, Vermont, and Rhode Island	2,450	1,944	2,376	1,524	1,704	1,608	0.5	0.5	0.6	0.3	0.4	0.4
Middle Atlantic	92,596	74,836	75,082	76,173	72,076	76,107	18.7	18.4	18.2	18.3	17.9	17.9
New York	26,753	23,605	22,974	22,980	21,092	21,737	5.4	5.8	5.6	5.5	5.2	5.1
New Jersey	7,814	6,391	6,087	5,910	6,455	6,901	1.6	1.6	1.5	1.4	1.6	1.6
Pennsylvania	58,029	44,840	46,021	47,283	44,529	47,469	11.7	11.0	11.1	11.4	11.1	11.2
East North Central	[1] 170,697	[2] 147,224	161,242	158,125	151,278	159,391	[1] 34.6	[2] 36.1	39.1	38.0	37.5	37.5
Ohio	55,612	[3] 44,390	[3] 50,071	49,624	44,998	48,324	11.3	[3] 10.9	[3] 12.2	11.9	11.2	11.4
Indiana	34,938	[3] 31,322	[3] 31,000	32,283	31,894	31,824	7.1	[3] 7.7	[3] 7.5	7.8	7.9	7.5
Illinois	[1] 42,718	38,806	39,720	38,705	37,479	39,259	[1] 8.6	9.5	9.6	9.3	9.3	9.2
Michigan	26,255	[2] 22,384	27,231	25,076	24,327	27,255	5.3	[2] 5.5	6.6	6.0	6.0	6.4
Wisconsin	11,174	10,322	13,220	12,437	12,580	12,729	2.3	2.5	3.2	3.0	3.1	3.0
West North Central	[1] 20,824	19,702	21,023	22,571	20,920	22,520	[1] 4.3	4.9	5.1	5.4	5.2	5.3
Minnesota	5,332	4,848	5,378	6,375	5,891	5,768	1.1	1.2	1.3	1.5	1.5	1.4
Iowa	[1] 4,878	4,869	5,062	4,946	4,439	5,047	[1] 1.0	1.2	1.2	1.2	1.1	1.2
Missouri	6,862	6,462	6,944	7,279	6,847	7,685	1.4	1.6	1.7	1.7	1.7	1.8
North Dakota and South Dakota	2,416	2,363	2,434	2,453	2,425	2,390	0.5	0.6	0.6	0.6	0.6	0.5
Nebraska and Kansas	1,336	1,160	1,205	1,518	1,318	1,630	0.3	0.3	0.3	0.4	0.3	0.4
South Atlantic	52,560	49,789	50,682	52,547	55,316	57,891	10.6	12.2	12.3	12.6	13.7	13.6
Delaware and Maryland	10,358	8,591	8,122	9,031	9,351	9,884	2.1	2.1	2.0	2.2	2.3	2.3
District of Columbia	1,097	1,060	1,105	1,002	968	813	0.2	0.3	0.3	0.2	0.2	0.2
Virginia	10,553	11,185	11,147	11,685	12,343	12,823	2.1	2.7	2.7	2.8	3.1	3.0
West Virginia	15,771	14,323	14,143	13,778	14,661	15,272	3.2	3.5	3.4	3.3	3.6	3.6
North Carolina	8,716	8,048	8,946	8,667	9,295	9,980	1.8	2.0	2.2	2.1	2.3	2.4
South Carolina	3,050	3,108	3,444	3,591	3,800	3,921	0.6	0.8	0.8	0.9	1.0	0.9
Georgia and Florida	3,015	3,474	3,775	4,793	4,898	5,198	0.6	0.8	0.9	1.1	1.2	1.2
East South Central	43,283	36,479	38,907	41,556	40,771	42,709	8.7	8.9	9.4	10.0	10.1	10.0
Kentucky	11,167	[4] 11,597	11,301	11,270	11,340	11,873	2.3	[4] 2.8	2.7	2.7	2.8	2.8
Tennessee	15,104	[4] 12,315	[5] 13,744	14,786	13,588	14,120	3.0	[4] 3.0	[5] 3.3	3.6	3.4	3.3
Alabama and Mississippi	17,012	12,567	[5] 13,862	15,500	15,843	16,716	3.4	3.1	[5] 3.4	3.7	3.9	3.9
West South Central: Arkansas, Louisiana, Oklahoma, and Texas	1,868	1,599	1,387	1,114	802	839	0.4	0.4	0.3	0.3	0.2	0.2
Mountain	8,779	7,362	7,346	8,536	8,932	8,898	1.8	1.7	1.8	2.1	2.2	2.1
Colorado	3,264	2,738	2,781	2,887	3,242	3,340	0.7	0.7	0.7	0.7	0.8	0.8
Utah	3,748	3,003	2,508	3,377	3,046	2,417	0.8	0.7	0.6	0.8	0.8	0.6
Montana and Idaho	923	881	941	952	1,045	1,108	0.2	0.2	0.3	0.2	0.3	0.3
Wyoming	607	510	894	1,006	1,328	1,438	0.1	0.1	0.2	0.3	0.3	0.3

New Mexico	92	98	113	171	138	107	(6)	(6)	(6)	0.1	(6)	(6)
Arizona and Nevada	145	132	109	143	133	488	(6)	(6)	(6)	(6)	(6)	0.1
Pacific	3,142	2,243	2,394	2,271	3,162	2,390	0.7	0.5	0.6	0.6	0.8	0.6
Washington and Oregon	1,324	958	897	953	992	964	0.3	0.2	0.2	0.3	0.3	0.2
California	1,818	1,285	1,497	1,318	2,170	1,426	0.4	0.3	0.4	0.3	0.5	0.4
Alaska	829	775	685	720	710	893	0.2	0.2	0.2	0.2	0.2	0.2
Canada [7]	17,878	[2] 11,980	12,381	11,413	11,166	11,702	3.6	[2] 2.9	3.0	2.7	2.8	2.8
Mexico	(8)	(8)	54	57	55	53	(8)	(8)	(6)	(6)	(6)	(6)
Destinations not revealable	-----	-----	-----	1,380	1,148	1,105	-----	-----	-----	0.3	0.3	0.2
U.S. railroad fuel	7,697	3,395	2,513	2,124	1,782	1,602	1.6	0.8	0.6	0.5	0.4	0.4
U.S. Great Lakes dock storage	(8)	1,436	304	363	−718	−29	(8)	0.4	0.1	0.1	−0.2	(6)
U.S. tidewater dock storage	(8)	10	26	-----	19	-----	(8)	(6)	(6)	-----	(6)	-----
Vessel fuel	1,859	1,267	1,544	1,419	1,083	1,183	0.4	0.3	0.4	0.3	0.3	0.3
Bunker fuel	41	27	17	4	3	12	(6)	(6)	(6)	(6)	(6)	(6)
Overseas exports	55,666	37,744	24,835	24,818	23,780	27,041	11.3	9.2	6.0	6.0	5.9	6.4
Coal used at mines and sales to employees	3,125	2,294	1,907	1,676	1,366	1,272	0.6	0.6	0.5	0.4	0.3	0.3
Net change in mine inventory	1,142	−469	−1,234	−61	−63	−949	0.2	−0.1	−0.3	(6)	(6)	−0.2

---

[1] District 15 shipments to Illinois included with Iowa.

[2] District 2 shipments in first quarter 1958 to Michigan included with Canada.

[3] District 9 shipments via river and ex-river to Ohio electric utilities included with Indiana.

[4] District 10 shipments in second, third, and fourth quarters 1958 to Tennessee included with Kentucky.

[5] District 10 shipments via river and ex-river to Alabama and Mississippi electric utilities included with Tennessee.

[6] Less than one-tenth of one percent.

[7] Includes shipments to Canadian Great Lakes commercial docks and Canadian railroad companies.

[8] Not available.

TABLE 67.—The changing levels of bituminous coal and lignite markets—indexes of physical volumes shipped to markets, 1957–62, by geographic division, State of destination, and consumer use

Geographic division, State of destination, and consumer use	1957 (thousand tons)	Index 1957=100 (except where noted)				
		1958	1959	1960	1961	1962
Total	493,895	82.7	83.5	84.3	81.6	86.0
Electric utilities	160,754	94.0	104.1	108.4	110.1	120.4
Coke and gas plants	112,901	70.7	73.8	76.3	69.8	68.6
Retail dealers	39,230	94.0	86.2	82.0	74.7	73.0
All others (includes vessel and bunker fuel)	108,711	85.9	89.6	85.4	83.4	87.6
Railroad fuel (U.S. and Canada)	9,581	43.3	30.2	23.5	19.6	18.0
Canadian Great Lakes commercial docks (consumer use not available)	2,785	79.2	57.9	61.6	43.6	26.1
U.S. Great Lakes dock storage (consumer use not available)	(1)	(1)	(1)	(1)	(1)	(1)
U.S. tidewater dock storage (consumer use not available)	(1)	(1)	(1)	(1)	(1)	(1)
Coal used at mines and sales to employees	3,125	73.4	61.0	53.6	43.7	40.7
Net change in inventory	1,142	−141.1	−208.1	−105.3	−105.5	−183.1
Overseas exports (excludes Canada—consumer use not available)	55,666	67.8	44.6	44.6	42.7	48.6
New England	11,909	91.3	93.6	78.2	81.2	83.9
Electric utilities	6,012	95.9	105.4	99.8	111.8	120.2
Coke and gas plants	1,345	74.0	81.0	42.4	35.3	35.3
Retail dealers	1,279	68.8	43.6	48.7	35.4	35.2
All others	3,273	98.6	96.7	64.8	61.8	57.0
Massachusetts	5,354	88.3	92.0	75.3	75.0	81.1
Electric utilities	2,575	97.3	103.8	94.0	103.8	119.1
Coke and gas plants	751	70.7	69.9	14.2	0.0	0.0
Retail dealers	755	40.4	38.7	55.2	36.7	38.3
All others	1,273	109.0	112.7	85.4	83.7	77.5
Connecticut	4,105	102.3	93.8	91.5	96.4	98.6
Electric utilities	2,567	97.9	99.6	110.2	121.1	127.2
Coke and gas plants	594	78.1	95.1	77.8	80.0	75.3
Retail dealers	139	151.1	47.5	61.9	44.6	46.8
All others	805	125.6	82.1	47.3	38.5	33.5
Maine, New Hampshire, Vermont, and Rhode Island	2,450	79.3	97.0	62.2	69.6	65.6
Electric utilities	870	86.1	127.1	86.3	108.3	102.6
Retail dealers	385	94.8	51.9	31.2	29.6	24.9
All others	1,195	69.5	89.5	54.6	54.2	51.0
Middle Atlantic	92,596	80.8	81.1	82.3	77.8	82.2
Electric utilities	31,662	89.5	94.1	96.7	97.2	104.5
Coke and gas plants	38,448	67.7	66.6	70.0	61.8	62.5
Retail dealers	2,498	112.9	75.4	71.3	65.7	61.6
All others	19,988	88.3	89.0	84.4	79.6	87.2
New York	26,753	88.2	85.9	85.9	78.8	81.3
Electric utilities	12,335	91.4	90.6	93.5	85.3	88.8
Coke and gas plants	5,693	76.7	71.2	75.6	66.4	70.2
Retail dealers	769	125.1	69.7	56.0	56.6	60.7
All others	7,956	88.0	90.6	84.4	79.8	79.5
New Jersey	7,814	81.8	77.9	75.6	82.6	88.3
Electric utilities	4,284	78.9	82.6	84.9	100.9	108.6
Coke and gas plants	1,249	78.5	66.5	59.7	45.1	35.2
Retail dealers	130	130.8	76.2	51.5	51.5	37.7
All others	2,151	86.6	75.4	68.0	69.8	81.9
Pennsylvania	58,029	77.3	79.3	81.5	76.7	81.8
Electric utilities	15,043	91.0	100.3	102.7	105.8	116.3
Coke and gas plants	31,506	65.6	65.8	69.4	61.6	62.2
Retail dealers	1,599	105.5	78.0	80.2	71.2	64.0
All others	9,881	89.0	90.7	88.0	81.5	94.6
East North Central	[2] 170,697	[3] 86.2	94.5	92.6	88.6	93.4
Electric utilities	66,436	93.1	102.9	104.7	102.7	112.5
Coke and gas plants	38,757	[3] 67.1	77.7	79.2	70.0	68.4
Retail dealers	21,321	90.3	90.7	82.1	76.0	74.8
All others	[2] 44,183	90.9	98.3	91.3	90.0	95.5
Ohio	55,612	79.8	[4] 90.0	89.2	80.9	86.9
Electric utilities	20,193	93.0	[4] 101.3	105.9	100.2	108.5
Coke and gas plants	15,661	58.2	80.3	75.9	58.3	60.5
Retail dealers	5,077	86.6	78.9	68.4	57.4	61.1
All others	14,681	82.4	88.8	87.9	86.6	94.1
Indiana	34,938	89.7	[4] 88.7	92.4	91.3	91.1
Electric utilities	12,853	96.5	[4] 104.6	106.8	106.8	115.2
Coke and gas plants	13,736	78.6	69.0	80.3	78.3	69.9
Retail dealers	2,796	97.2	86.4	78.0	72.6	69.0
All others	5,553	97.2	101.9	96.5	96.9	99.0
Illinois	[2] 42,718	90.8	93.0	90.6	87.7	91.9
Electric utilities	18,584	92.8	97.2	103.0	103.2	109.7
Coke and gas plants	3,925	67.8	78.1	75.1	70.7	73.2

See footnotes at end of table.

TABLE 67.—The changing levels of bituminous coal and lignite markets—indexes of physical volumes shipped to markets, 1957–62, by geographic division, State of destination, and consumer use—Continued

Geographic division, State of destination, and consumer use	1957 (thousand tons)	Index 1957=100 (except where noted)				
		1958	1959	1960	1961	1962
East North Central—Continued						
Illinois—Continued						
Retail dealers	8,623	91.3	84.4	76.2	66.1	67.3
All others	[2] 11,586	95.2	97.7	86.8	84.8	88.1
Michigan	26,255	[3] 85.3	103.7	95.5	92.7	103.8
Electric utilities	9,839	86.4	108.5	103.6	101.6	124.8
Coke and gas plants	4,877	[3] 63.2	92.0	92.6	84.5	87.1
Retail dealers	3,368	84.9	85.9	73.0	74.6	70.0
All others	8,171	97.4	112.3	96.8	94.2	102.5
Wisconsin	11,174	92.4	118.3	111.3	112.6	113.9
Electric utilities	4,967	98.5	115.3	103.7	101.6	108.1
Coke and gas plants	558	62.7	89.4	60.9	62.4	52.9
Retail dealers	1,457	96.9	188.2	194.2	209.0	189.8
All others	4,192	87.5	101.4	98.3	98.8	102.5
West North Central	[2] 20,824	94.6	101.0	108.4	100.5	108.1
Electric utilities	8,278	101.0	110.6	127.3	123.9	147.6
Coke and gas plants	1,518	68.6	74.5	62.3	39.0	50.6
Retail dealers	4,079	94.6	99.3	101.1	89.5	79.9
All others	[2] 6,949	92.7	96.3	100.2	92.4	90.3
Minnesota	5,332	90.9	100.9	119.6	110.5	108.2
Electric utilities	1,810	120.7	126.6	162.9	154.5	169.0
Coke and gas plants	1,206	69.0	73.2	60.6	43.2	52.4
Retail dealers	553	66.5	146.3	176.1	178.7	131.5
All others	1,763	83.0	79.1	97.7	90.0	76.7
Iowa	[2] 4,878	99.8	103.8	101.4	91.0	103.5
Electric utilities	1,846	105.6	112.7	111.6	100.6	127.1
Retail dealers	1,254	92.9	82.9	74.9	63.2	63.9
All others	[2] 1,778	98.7.	109.3	109.5	100.7	106.8
Missouri	6,862	94.2	101.2	106.1	99.8	112.0
Electric utilities	2,605	101.2	118.1	138.1	142.2	176.2
Coke and gas plants	312	67.0	79.5	68.6	22.8	0.0
Retail dealers	1,495	92.6	82.9	81.8	68.3	61.7
All others	2,450	91.1	97.1	91.6	83.7	83.1
North Dakota and South Dakota	2,416	97.8	100.7	101.5	100.4	98.9
Electric utilities	1,378	81.1	87.4	91.1	99.3	103.7
Retail dealers	517	130.2	137.1	135.4	126.5	118.6
All others	521	109.8	99.8	95.4	77.2	66.8
Nebraska and Kansas	1,336	86.8	90.2	113.6	98.7	122.0
Electric utilities	639	74.5	78.1	106.3	82.6	124.3
Retail dealers	260	103.1	97.7	111.2	75.4	75.8
All others	437	95.2	103.4	125.9	135.9	146.2
South Atlantic	52,560	94.7	96.4	100.0	105.2	110.1
Electric utilities	22,251	102.2	118.3	122.1	134.0	143.6
Coke and gas plants	11,321	84.5	67.1	74.6	73.4	73.5
Retail dealers	4,765	102.0	74.7	77.9	66.3	70.0
All others	14,223	88.8	92.7	93.0	98.6	100.5
Delaware and Maryland	10,358	82.9	78.4	87.2	90.3	95.4
Electric utilities	3,000	92.5	119.7	125.4	137.6	144.2
Coke and gas plants	5,414	77.7	55.6	76.6	76.3	82.6
Retail dealers	420	144.8	105.0	55.0	51.0	56.9
All others	1,524	65.9	70.7	58.4	57.6	55.6
District of Columbia	1,097	96.6	100.7	91.3	88.2	74.1
Electric utilities	609	99.5	108.5	70.1	67.7	52.5
Retail dealers	188	104.3	80.3	73.4	77.1	78.7
All others	300	86.0	97.7	145.7	137.0	115.0
Virginia	10,553	106.0	105.6	110.7	117.0	121.5
Electric utilities	4,435	118.1	137.3	138.2	151.2	162.2
Coke and gas plants	165	84.2	24.8	101.8	46.7	19.4
Retail dealers	1,756	96.6	65.2	75.5	64.5	62.6
All others	4,197	98.0	92.2	96.7	105.5	107.1
West Virginia	15,771	90.8	89.7	87.4	93.0	96.8
Electric utilities	6,290	88.2	95.7	94.8	103.2	111.2
Coke and gas plants	5,742	90.7	79.0	71.8	71.4	66.4
Retail dealers	302	115.6	67.9	83.1	82.8	112.9
All others	3,437	93.6	98.5	100.0	111.1	119.9
North Carolina	8,716	92.3	102.6	99.4	106.6	114.5
Electric utilities	4,953	98.4	112.1	108.1	123.0	135.4
Retail dealers	1,248	92.4	78.9	82.3	66.8	70.6
All others	2,515	80.4	95.8	90.9	94.2	95.1
South Carolina	3,050	101.9	112.9	117.7	124.6	128.6
Electric utilities	856	130.5	176.1	192.5	222.8	236.8
Retail dealers	321	129.6	96.3	107.5	84.1	90.0
All others	1,873	84.1	86.9	85.3	86.7	85.7

See footnotes at end of table.

TABLE 67.—The changing levels of bituminous coal and lignite markets—indexes of physical volumes shipped to markets, 1957–62, by geographic division, State of destination, and consumer use—Continued

Geographic division, State of destination, and consumer use	1957 (thousand tons)	Index 1957=100 (except where noted)				
		1958	1959	1960	1961	1962
South Atlantic—Continued						
Georgia and Florida	3,015	115.2	125.2	159.0	162.5	172.4
Electric utilities	2,108	122.3	138.2	184.1	193.8	207.8
Coke and gas plants	--------	(2)	(2)	--------	--------	--------
Retail dealers	530	83.0	61.3	74.5	59.4	63.4
All others	377	118.8	140.6	137.1	132.1	127.9
East South Central	43,283	84.3	89.9	96.0	94.2	36.5
Electric utilities	23,572	92.0	103.7	112.6	115.0	122.4
Coke and gas plants	10,380	73.1	77.7	80.8	69.8	70.3
Retail dealers	2,494	100.1	76.3	78.5	74.7	72.6
All others	6,837	68.9	65.8	68.3	66.6	69.3
Kentucky	11,167	[5] 103.9	101.2	100.9	101.5	106.3
Electric utilities	6,758	[5] 106.0	109.9	107.6	108.1	117.8
Coke and gas plants	1,683	97.7	86.7	87.6	91.0	83.8
Retail dealers	834	[6] 105.9	84.4	83.8	99.6	77.2
All others	1,892	100.6	90.6	96.3	88.3	98.4
Tennessee	15,104	[5] 81.5	91.0	97.9	90.0	93.5
Electric utilities	9,876	[5] 91.7	109.1	119.2	107.2	112.8
Coke and gas plants	258	58.1	72.5	73.6	89.9	96.5
Retail dealers	1,206	[6] 103.4	77.2	81.0	69.4	71.6
All others	3,764	49.3	49.1	49.0	51.4	49.5
Alabama and Mississippi	17,012	73,9	81.5	91.9	93.1	98.3
Electric utilities	6,938	78.7	89.9	107.9	133.0	140.7
Coke and gas plants	8,439	68.6	76.1	79.7	64.9	66.8
Retail dealers	454	80.6	59.3	62.3	43.0	66.5
All others	1,181	80.4	79.6	85.0	80.0	85.8
West South Central: Arkansas, Louisiana, Oklahoma and Texas	1,868	85.6	74.3	59.6	42.9	44.9
Electric utilities	65	1.5	0.0	0.0	0.0	0.0
Coke and gas plants	1,050	92.0	79.2	67.3	49.0	61.5
Retail dealers	161	32.9	36.0	44.1	28.0	28.6
All others	592	97.8	84.0	56.8	41.0	24.8
Mountain	8,779	83.9	83.7	97.2	101.7	101.4
Electric utilities	1,437	107.2	161.9	193.5	237.1	263.6
Coke and gas plants	3,772	75.0	60.9	80.9	76.5	60.9
Retail dealers	1,350	95.6	85.5	86.4	82.7	88.4
All others	2,220	76.6	70.6	69.3	68.6	73.0
Colorado	3,264	83.9	85.2	88.4	99.3	102.3
Electric utilities	687	86.9	139.2	177.1	205.1	227.4
Coke and gas plants	1,324	72.1	62.2	64.6	75.4	70.4
Retail dealers	326	97.5	94.8	81.3	85.9	100.0
All others	927	93.6	74.8	59.3	59.9	56.1
Utah	3,748	80.1	66.9	90.1	81.3	64.5
Electric utilities	367	136.0	120.2	137.6	150.4	124.0
Coke and gas plants	2,448	76.6	60.2	89.7	77.1	55.8
Retail dealers	334	95.5	72.2	76.9	75.1	81.7
All others	599	51.8	58.8	70.1	59.3	54.1
Montana and Idaho	923	95.4	102.0	103.1	113.2	120.0
Electric utilities [7]	1	41.3	100.0	105.6	149.2	164.8
Retail dealers	593	95.6	85.5	87.5	80.6	80.9
All others	329	72.9	77.5	74.2	91.2	101.2
Wyoming	607	84.0	147.3	165.7	218.8	236.9
Electric utilities	340	96.8	211.5	245.6	336.2	326.8
Retail dealers	61	95.1	96.7	96.7	91.8	98.4
All others	206	59.7	56.3	54.4	62.6	129.6
New Mexico	92	106.5	122.8	185.9	150.0	116.3
Electric utilities	37	100.0	73.0	78.4	89.2	81.1
Retail dealers	12	108.3	216.7	358.3	291.7	250.0
All others	43	111.6	139.5	230.2	162.8	109.3
Arizona and Nevada	145	91.0	75.2	98.6	91.7	336.6
Electric utilities [8]	5	1.5	1.5	1.5	0.9	100.0
Retail dealers	24	66.7	50.0	100.0	70.8	100.0
All others	116	95.7	79.3	98.3	97.4	111.2
Pacific	3,142	71.4	76.2	72.3	100.6	76.1
Electric utilities	4	50.0	.0	.0	.0	.0
Coke and gas plants	1,708	73.3	86.4	75.3	124.2	80.9
Retail dealers	377	98.4	97.3	95.0	106.9	77.7
All others	1,053	58.7	52.3	59.5	60.6	68.0
Washington and Oregon	1,324	72.4	67.7	72.0	74.9	72.8
Electric utilities	3	66.7	.0	.0	.0	.0
Retail dealers	367	98.9	98.6	95.6	108.2	78.2
All others	954	62.2	56.1	63.1	62.4	71.0
California	1,818	70.7	82.3	72.5	119.4	78.4
Electric utilities	1	.0	.0	.0	.0	.0

See footnotes at end of table.

TABLE 67.—The changing levels of bituminous coal and lignite markets—indexes of physical volumes shipped to markets, 1957–62, by geographic division, State of destination, and consumer use—Continued

Geographic division, State of destination, and consumer use	1957 (thousand tons)	Index 1957=100 (except where noted)				
		1958	1959	1960	1961	1962
Pacific—Continued						
California—Continued						
Coke and gas plants	1,708	70.7	86.4	75.3	124.2	80.9
Retail dealers	10		50.0	70.0	60.0	60.0
All others	99		16.2	25.3	43.4	39.4
Alaska	829	93.5	82.6	86.9	85.6	107.7
Electric utilities	470	95.7	94.5	87.7	43.8	61.5
Retail dealers	49	104.1	138.8	134.7	134.7	155.1
All others	310	88.4	55.8	78.1	141.3	170.3
Canada [9]	17,878	[3] 67.0	69.3	63.8	62.5	60.7
Electric utilities	567	70.9	35.3	30.7	21.5	206.2
Coke and gas plants	4,602	[3] 77.9	111.1	102.5	114.2	109.6
Retail dealers	857	111.2	102.3	81.3	75.5	74.6
All others	7,183	56.7	58.5	55.5	53.4	55.7
Canadian Great Lakes Commercial docks (consumer use not available)	2,785	79.2	57.9	61.6	43.6	26.1
Canadian railroad companies	1,884	40.2	20.0	6.7	5.0	6.5
Mexico [10]	(1)	(1)	(1)	100.0	96.5	93.0
All others [10]	(1)	(1)	(1)	100.0	96.5	93.0
Destinations not revealable [11]	-----	-----	-----	100.0	83.2	80.1
Electric utilities [11]	-----	-----	-----	100.0	74.6	42.1
Coke and gas plants [11]	-----	-----	-----	100.0	141.2	172.7
Retail dealers [11]	-----	-----	-----	100.0	69.7	32.3
All others [11]	-----	-----	-----	100.0	43.9	53.2
Destinations not available						
Great Lakes vessel fuel [12]	1,859	68.2	83.1	76.3	58.3	63.6
Tidewater bunker fuel [12]	41	65.9	41.5	9.8	7.3	29.3
Railroad fuel, United States companies [13]	7,697	44.0	32.6	27.6	23.2	22.4

[1] Not available.
[2] District 15 shipments to Illinois included with Iowa.
[3] District 2 shipments in first quarter 1958 to Michigan included with Canada.
[4] District 9 shipments via river and ex-river to Ohio electric utilities included with Indiana.
[5] District 10 shipments in second, third, and fourth quarters 1958 to Tennessee included with Kentucky.
[6] District 10 shipments in fourth quarter 1958 to Tennessee included with Kentucky.
[7] For electric utilities in Montana and Idaho the annual base period is 1959=100. The 1959 tonnage shipped to electric utilities was 179,000 tons.
[8] For electric utilities in Arizona and Nevada the annual base period is 1962=100. The 1962 annual tonnage shipped to electric utilities was 335,000 tons.
[9] Includes shipments to Canadian Great Lakes commercial docks and Canadian railroad companies.
[10] Since tonnages for Mexico were first published in 1960, yearly indexes are based on 1960=100. In thousands of tons, 1960 tons were total 57, all others 57.
[11] Since "Destinations not revealable" were first published during 1960, the calendar year indexes are based on 1960=100. In thousands of tons these figures are as follows: Calendar year 1960 total not revealable 1,380, electric utilities 497, coke and gas plants 374, retail dealers 99, all others 410.
[12] Included in summary at beginning of table in all others.
[13] Included in summary at beginning of table in railroad fuel.

RELATIVE RATE OF GROWTH OF MINERAL FUELS AND WATERPOWER

Information on the trends in consumption of the various energy fuels and waterpower is presented in the Review of Mineral-Fuel Industries, Minerals Yearbook, 1962, volume 2.

STOCKS

The figures on stocks are based on complete coverage for all categories except "Other manufacturing and mining industries" and "Retail dealer stocks." Stocks for these two categories are based on samples, and the statistical procedure followed is that for calculating total consumption.

TABLE 68.—Stocks of bituminous coal and lignite in the hands of commercial consumers and in retail dealers' yards in the United States

Date	Total stocks (net tons)	Days' supply at current rate of consumption on date of stocktaking						
		Electric power utilities	Manufacturing and mining industries				Retail dealers	Total
			Oven coke plants	Steel and rolling mills	Cement mills	Other manufacturing and mining industries		
1961								
Jan. 31	69,194,000	86	66	20	55	40	4	62
Feb. 28	66,463,000	86	58	20	53	41	5	62
Mar. 31	65,183,000	94	57	22	47	42	5	66
Apr. 30	65,007,000	100	52	22	46	43	6	69
May 31	67,893,000	107	50	28	45	46	12	74
June 30	70,698,000	106	49	33	47	53	16	76
July 31	67,139,000	102	43	36	46	54	18	74
Aug. 31	69,353,000	98	44	34	55	51	11	70
Sept. 30	70,697,000	100	42	32	55	51	9	69
Oct. 31	72,612,000	102	44	29	55	47	7	67
Nov. 30	73,851,000	96	46	23	58	45	7	65
Dec. 31	71,418,000	89	44	20	51	41	4	59
1962								
Jan. 31	66,940,000	79	41	18	56	38	3	53
Feb. 28	64,523,000	79	38	19	57	37	3	52
Mar. 31	63,222,000	81	39	22	48	41	3	55
Apr. 30	64,185,000	92	40	24	45	46	5	62
May 31	66,402,000	92	47	30	43	50	15	69
June 30	69,327,000	94	58	30	44	52	18	73
July 31	66,098,000	91	51	31	45	63	16	73
Aug. 31	68,489,000	90	49	29	45	59	11	71
Sept. 30	70,241,000	99	47	26	47	57	8	72
Oct. 31	72,818,000	100	49	23	50	50	6	71
Nov. 30	73,578,000	95	49	21	48	48	6	67
Dec. 31	69,691,000	83	45	18	47	44	4	59

PRICES

TABLE 69.—Average value per ton, f.o.b. mines, of bituminous coal and lignite produced in the United States, by States

State	1961				1962			
	Underground	Strip	Auger	Total	Underground	Strip	Auger	Total
Alabama	$7.67	$4.79	$4.77	$7.04	$7.95	$5.40	$6.49	$7.39
Alaska	6.77	8.17	--------	7.96	6.30	7.51	--------	7.35
Arkansas	8.10	6.75	--------	7.31	7.41	6.89	--------	7.07
Colorado	6.61	3.68	--------	6.20	6.37	3.65	--------	5.92
Georgia	5.00	--------	--------	5.00	3.53	--------	--------	3.53
Illinois	3.87	3.96	2.00	3.91	3.81	3.90	--------	3.86
Indiana	4.14	3.79	--------	3.89	4.14	3.70	--------	3.82
Iowa	4.41	3.43	--------	3.58	4.27	3.44	--------	3.56
Kansas	4.67	4.67	--------	4.67	4.64	4.64	--------	4.64
Kentucky	4.52	3.36	3.09	4.06	4.33	3.27	3.06	3.91
Maryland	4.72	3.21	--------	3.79	4.58	3.32	--------	3.86
Missouri	5.43	4.25	--------	4.28	5.20	4.14	--------	4.16
Montana:								
Bituminous	6.78	6.43	--------	6.76	6.97	5.25	--------	6.90
Lignite	4.59	1.91	--------	2.01	4.81	1.91	--------	1.99
Total Montana	6.56	2.04	--------	3.26	6.76	1.94	--------	2.98
New Mexico	6.05	5.03	--------	6.01	5.21	2.86	--------	3.83
North Dakota (lignite)	4.78	2.25	--------	2.25	4.70	2.24	--------	2.24
Ohio	4.39	3.57	3.12	3.77	4.34	3.51	3.18	3.72
Oklahoma	8.93	6.18	--------	6.58	12.59	5.60	--------	6.66
Pennsylvania	5.98	3.60	3.15	5.17	5.84	3.66	3.13	5.07
South Dakota (lignite)	--------	4.20	--------	4.20	--------	4.30	--------	4.30
Tennessee	3.63	3.39	3.02	3.53	3.78	3.41	3.39	3.63
Utah	6.03	--------	--------	6.03	5.40	--------	--------	5.40
Virginia	4.25	2.98	2.88	4.16	4.08	2.94	3.50	3.99
Washington	7.15	9.71	--------	7.24	6.94	6.40	--------	6.94
West Virginia	5.05	3.55	3.53	4.94	4.99	3.61	3.56	4.88
Wyoming	6.93	2.91	--------	3.39	6.12	2.90	--------	3.20
Total	5.02	3.67	3.24	4.58	4.91	3.64	3.33	4.48

TABLE 70.—Production and average value per ton, f.o.b. mines, of bituminous coal and lignite sold in open market and not sold in open market, 1962, by States

State	Production					Average value per ton, f.o.b. mines		
	Sold in open market		Not sold in open market		Total (net tons)	Sold in open market	Not sold in open market	Total
	Net tons	Percentage of total	Net tons	Percentage of total				
Alabama	5,266,209	40.9	7,613,451	59.1	12,879,660	$6.46	$8.03	$7.39
Alaska	853,100	97.9	18,279	2.1	871,379	7.36	7.05	7.35
Arkansas	255,739	100.0			255,739	7.07		7.07
Colorado	2,698,483	79.9	680,917	20.1	3,379,400	5.04	9.39	5.92
Georgia	7,830	100.0			7,830	3.53		3.53
Illinois	48,487,362	100.0			48,487,362	3.86		3.86
Indiana	15,701,592	100.0	7,310		15,708,902	3.82	4.14	3.82
Iowa	1,129,564	100.0			1,129,564	3.56		3.56
Kansas	914,999	100.0			914,999	4.64		4.64
Kentucky	63,143,880	91.2	6,068,139	8.8	69,212,019	3.71	6.00	3.91
Maryland	820,621	100.0			820,621	3.86		3.86
Missouri	2,895,967	100.0			2,895,967	4.16		4.16
Montana:								
Bituminous	77,663	100.0			77,663	6.90		6.90
Lignite	304,496	100.0			304,496	1.99		1.99
Total Montana	382,159	100.0			382,159	2.98		2.98
New Mexico	434,179	64.1	242,978	35.9	677,157	3.17	5.01	3.83
North Dakota (lignite)	2,732,854	100.0			2,732,854	2.24		2.24
Ohio	29,799,354	87.3	4,325,309	12.7	34,124,663	3.79	3.24	3.72
Oklahoma	905,391	86.4	142,657	13.6	1,048,048	5.62	13.22	6.66
Pennsylvania	41,646,745	63.8	23,668,641	36.2	65,315,386	4.27	6.49	5.07
South Dakota (lignite)	17,914	100.0			17,914	4.30		4.30
Tennessee	6,150,392	99.0	63,219	1.0	6,213,611	3.63	3.52	3.63
Utah	2,387,242	55.6	1,909,778	44.4	4,297,020	4.71	6.27	5.40
Virginia	29,344,693	99.6	129,630	.4	29,474,323	3.99	4.54	3.99
Washington	231,448	98.5	3,509	1.5	234,957	6.90	9.26	6.94
West Virginia	104,656,871	88.3	13,842,196	11.7	118,499,067	4.73	6.05	4.88
Wyoming	1,273,517	49.6	1,295,207	50.4	2,568,724	3.35	3.04	3.20
Total	362,138,105	85.8	60,011,220	14.2	422,149,325	4.19	6.25	4.48

LIGNITE

TABLE 71.—Summary of operations at lignite mines in the United States, 1962, by States [1]

Item	Montana	North Dakota	South Dakota	Total
UNDERGROUND MINES				
Number of mines	3	1		4
Shot from solid ... net tons	6,712	2,059		8,771
Cut by machines ... do	1,318			1,318
Total production ... do	8,030	2,059		10,089
Number of cutting machines	2			2
Average output per machine ... net tons	659			659
Underground production cut by machine ... percent	16.4			16.4
Average value per ton	$4.81	$4.70		$4.79
Average number of men working daily	10	3		13
Average number of days worked	131	69		117
Number of man-days worked	1,311	209		1,520
Average tons per man per day	6.13	9.85		6.64
STRIP MINES				
Number of mines	2	32	1	35
Production ... net tons	296,466	2,730,795	17,914	3,045,175
Average value per ton	$1.91	$2.24	$4.30	$2.22
Number of shovels and draglines	3	50	2	55
Average number of men working daily	21	312	8	341
Average number of days worked	197	208	189	207
Number of man-days worked	4,141	64,778	1,513	70,432
Average tons per man per day	71.59	42.16	11.84	43.24
TOTAL, ALL LIGNITE MINES				
Number of mines	5	33	1	39
Production (net tons):				
Shipped by rail [2]	295,360	1,927,937		2,223,297
Shipped by truck	9,136	442,282	17,914	469,332
Used at mine [3]		362,635		362,635
Total	304,496	2,732,854	17,914	3,055,264
Average value per ton	$1.99	$2.24	$4.30	$2.23
Average number of men working daily	31	315	8	354
Average number of days worked	176	206	189	203
Number of man-days worked	5,452	64,987	1,513	71,952
Average tons per man per day	55.85	42.05	11.84	42.46

[1] Exclusive of Texas (lignite).
[2] Includes coal loaded at mine directly into railroad cars and hauled by trucks to railroad sidings.
[3] Includes coal used at mine for power and heat, made into beehive coke at mine, used by mine employees, all other uses at mine, taken by locomotive tender, and transported from mine to point of use by conveyer or tram.

FOREIGN TRADE [8]

Imports of bituminous coal and lignite are very small. Exports have been an important item of foreign trade for many years, particularly since the close of World War II. See figure 16.

---

[8] Figures on imports and exports compiled by M. B. Price and E. D. Page, of the Bureau of Mines, from records of the Bureau of the Census, U.S. Department of Commerce.

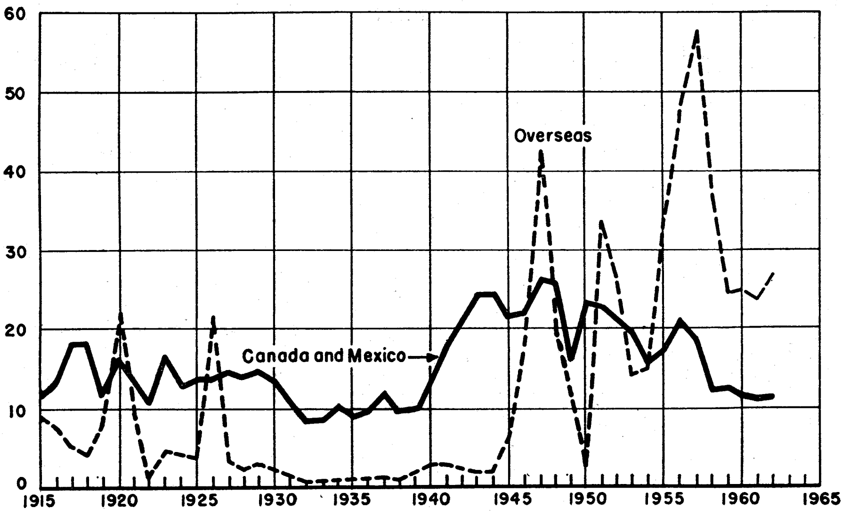


FIGURE 16.—Exports of bituminous coal and lignite from the United States to Canada and Mexico and overseas, 1915–62.

TABLE 72.—Bituminous coal[1] imported for consumption in the United States, by countries and customs districts

(Net tons)

Country and customs district	1960	1961	1962
Country:			
North America: Canada	260,372	164,125	232,417
Asia: Japan	123	134	7
Total	260,495	164,259	232,424
Customs district:			
Alaska	20	10	20
Buffalo	------	------	783
Colorado	------	80	------
Dakota	11	------	------
Duluth and Superior	------	------	2,214
Galveston	51	------	------
Los Angeles	123	134	------
Maine and New Hampshire	115,779	136,732	224,199
Massachusetts	------	------	7
Michigan	57	------	------
Montana and Idaho	49,494	27,008	5,196
New York	------	295	------
Pittsburgh	37	------	------
St. Lawrence	------	------	5
Washington	94,923	------	------
Total	260,495	164,259	232,424

[1] Includes slack, culm, and lignite.

Source: Bureau of the Census.

TABLE 73.—Exports of bituminous coal, by country groups

(Thousand net tons)

Year	Canada (including Newfoundland) and Mexico	Overseas (all other countries)								Grand total
		West Indies and Central America[1]	Miquelon, Bermuda, and Greenland	South America	Europe	Asia	Africa	Oceania	Total overseas	
1953–57 (average)	18,404	51	3	1,935	27,663	3,974	185	---------	33,811	52,215
1958	12,272	34	1	1,452	32,889	3,550	95	---------	38,021	50,293
1959	12,459	17	(2)	1,499	19,128	4,077	73	---------	24,794	37,253
1960	11,696	18	2	2,178	16,936	5,654	57	---------	24,845	36,541
1961	11,223	3	3	1,786	15,275	6,617	63	(2)	23,747	34,970
1962	11,461	10	5	2,159	18,284	6,467	27	---------	26,952	38,413

[1] Includes Panama.
[2] Less than 1,000 tons.

Source: Bureau of the Census.

TABLE 74.—Bituminous coal exported from the United States, by countries[1]

(Net tons)

Country	1959	1960	1961	1962
North America:				
Canada	12,406,800	11,638,739	11,169,056	11,409,746
Central America:				
Costa Rica	20	20	147	50
El Salvador	45	45	101	144
Guatemala	120	136	229	3,208
Honduras	170	135	450	439
Other	25	52	87	162
Greenland	-----	-----	-----	506
Mexico	51,512	57,332	53,992	51,109
Miquelon	643	2,328	2,813	4,759
West Indies:				
British:				
Bahamas	-----	-----	-----	3,042
Jamaica	-----	-----	25	68
Trinidad and Tobago	2,549	2,129	466	1,795
Cuba	12,758	14,482	-----	-----
Dominican Republic	226	59	355	-----
French	521	588	906	623
Haiti	150	-----	-----	-----
Netherlands Antilles	100	-----	-----	15
Total North America	12,475,639	11,716,045	11,228,627	11,475,666
South America:				
Argentina	397,786	680,546	576,990	670,727
Brazil	880,970	1,048,716	978,700	1,316,150
Chile	162,312	368,545	177,999	114,126
Uruguay	58,253	79,919	33,972	57,779
Venezuela	28	-----	16,970	-----
Other	-----	34	1,337	438
Total South America	1,499,349	2,177,760	1,785,968	2,159,220
Europe:				
Austria	809,985	587,626	[2] 322,707	251,949
Belgium-Luxembourg	1,150,373	1,106,037	904,907	1,083,949
Czechoslovakia	-----	-----	39,617	13,761
Denmark	189,309	130,157	80,022	37,570
Finland	5,553	-----	-----	568
France	1,042,303	732,319	643,729	710,080
Germany, West	4,463,301	4,565,556	[2] 4,203,520	4,812,249
Greece	20,763	-----	-----	57,554
Ireland	417,365	207,787	195,255	241,011
Italy	5,200,296	4,845,814	4,728,556	5,837,218
Netherlands	3,288,234	2,785,484	2,447,480	3,186,593
Norway	110,969	76,932	50,918	17,453
Portugal	147,512	52,453	67,046	125,398
Spain	747,165	331,439	227,574	766,095
Sweden	749,546	645,193	820,136	725,715
Switzerland	262,668	322,815	70,494	-----
Trieste	88,065	38,392	51,970	-----
United Kingdom	24,499	-----	-----	1,933
Yugoslavia	410,619	508,427	420,444	414,514
Total Europe	19,128,525	16,936,431	15,274,375	18,283,610
Asia:				
Indonesia	48,973	23,308	1,079	-----
Japan	4,020,288	5,617,191	6,610,166	6,465,395
Korea, Republic of	7,318	-----	-----	-----
Turkey	-----	11,814	-----	63
Viet-Nam	-----	-----	6,121	-----
Other	291	1,428	79	1,700
Total Asia	4,076,870	5,653,741	6,617,445	6,467,158
Africa:				
Angola	-----	5,596	55	-----
Canary Islands	2,799	-----	-----	-----
Libya	44,644	44,832	45,432	16,408
United Arab Republic (Egypt)	25,605	5,731	17,815	11,362
Other	-----	939	-----	-----
Total Africa	73,048	57,098	63,302	27,770
Oceania: Australia	-----	-----	108	-----
Grand total	37,253,431	36,541,075	34,969,825	38,413,424

---

[1] Amounts stated do not include fuel or bunker coal loaded on vessels engaged in foreign trade, which aggregated 165,806 tons in 1959, 307,812 tons in 1960, 275,017 tons in 1961, and 213,161 tons in 1962.

[2] Revised figure.

Source: Bureau of the Census.

TABLE 75.—Bituminous coal exported from the United States, by customs districts

(Net tons)

Customs district	1959	1960	1961	1962
North Atlantic:				
Maine and New Hampshire	5,933	2,120	2,459	3,224
Massachusetts	9,812	54	-----	187
New York	9,835	12,255	5,448	23,300
Philadelphia	80,818	39,092	14,900	41,048
South Atlantic:				
Georgia	102	-----	-----	-----
Maryland	1,586,620	1,471,576	1,160,824	2,119,628
Virginia	23,031,575	23,231,067	22,644,561	24,883,469
Gulf Coast:				
Florida	63	-----	-----	-----
Galveston	559	45	1,092	316
Mobile	101,671	110,031	30,086	(1)
New Orleans	315	388	1,277	1,151
Sabine	-----	2,440	-----	-----
Mexican border:				
Arizona	-----	199	-----	61
El Paso	51,005	56,802	55,353	[2] 49,075
Laredo	266	239	417	1,841
Pacific Coast:				
Los Angeles	-----	60	-----	-----
Oregon	-----	-----	-----	-----
San Diego	2	92	-----	-----
San Francisco	-----	-----	81	30
Washington	1,231	8,254	820	1,186
Northern border:				
Buffalo	344,102	232,078	148,542	150,701
Chicago	112,298	40,412	33,079	10,821
Dakota	17,892	15,294	9,544	7,721
Duluth and Superior	21,420	12,139	6,516	22,482
Indiana	-----	939	4,822	4,777
Michigan	566,843	349,790	271,739	259,223
Minnesota	223	-----	-----	-----
Montana and Idaho	219	289	1,921	2,282
Ohio	9,420,259	9,312,614	9,061,261	[1] 9,096,160
Rochester	1,304,766	1,265,978	1,207,334	1,493,491
St. Lawrence	548,412	375,447	298,277	240,901
Vermont	115	55	141	[2] 235
Wisconsin	-----	-----	42	-----
Miscellaneous:				
Alaska	-----	-----	-----	84
Kentucky	54	1,326	-----	30
Pittsburgh	16,661	-----	-----	-----
St. Louis	-----	-----	9,289	-----
Total	[3] 37,253,431	36,541,075	34,969,825	38,413,424

[1] Ohio customs district has been adjusted by Bureau of Mines to include 1,020 tons credited to Mobile customs district by the Bureau of the Census.

[2] El Paso customs district has been adjusted by the Bureau of Mines to include 2,225 tons credited to Vermont customs district by the Bureau of the Census.

[3] Includes 20,360 tons in 1959, representing estimated data for which district breakdown is not available.

Source: Bureau of the Census.

TABLE 76.—Shipments of bituminous coal to possessions and other areas administered by the United States

(Net tons)

Territory	1960	1961	1962
Guam	2	4	3
Puerto Rico	1,499	1,659	2,264
Virgin Islands	2	[1] 8	11

[1] Revised figure.

Source: Bureau of the Census

WORLD PRODUCTION

The United States supplied 439 million tons of bituminous coal, anthracite, and lignite, or 15 percent of the world output, in 1962. World coal output increased 3 percent, principally in the United States and Europe.

TABLE 77.—World production of bituminous coal, anthracite, and lignite by countries [1]

(Thousand short tons)

Country	1958	1959	1960	1961	1962 [2]
North America:					
Canada:					
Bituminous	9,434	8,679	8,840	8,189	8,028
Lignite	2,253	1,947	2,171	2,209	2,256
Greenland: Bituminous	35	29	31	35	29
Mexico: Bituminous	1,621	1,748	1,958	2,004	2,087
United States:					
Anthracite (Pennsylvania)	21,171	20,649	18,817	17,446	16,894
Bituminous	408,019	409,248	412,766	399,959	419,094
Lignite	2,427	2,780	2,746	3,018	3,055
Total	444,960	445,080	447,329	432,860	451,443
South America:					
Argentina: Bituminous	288	348	309	379	349
Brazil: Bituminous (including lignite)	2,469	2,568	2,568	2,635	2,698
Chile: Bituminous (mined)	2,204	2,083	1,570	1,944	1,929
Colombia: Bituminous	2,690	2,756	2,866	3,086	3,307
Peru: Bituminous and anthracite	246	191	179	184	179
Venezuela: Bituminous	40	37	39	34	30
Total	7,937	7,983	7,531	8,262	8,492
Europe:					
Albania: Lignite	282	317	320	336	[3] 330
Austria:					
Bituminous	155	148	146	117	109
Lignite	7,158	6,857	6,584	6,240	6,296
Belgium: Bituminous and anthracite	29,831	25,085	24,763	23,739	23,398
Bulgaria:					
Bituminous and anthracite	419	554	628	651	681
Lignite	13,614	16,377	18,273	19,890	22,236
Czechoslovakia:					
Bituminous	26,380	27,694	28,896	28,917	31,085
Lignite	62,653	59,198	64,378	71,984	76,280
Denmark: Lignite	2,695	2,540	2,545	2,384	2,232
France:					
Bituminous and anthracite	63,632	63,501	61,692	57,715	57,716
Lignite	2,555	2,398	2,512	3,203	3,177
Germany:					
Bituminous and anthracite:					
East	3,201	3,132	2,999	2,950	2,844
West (including Saar)	165,286	157,237	157,911	158,309	156,417
Lignite:					
East	236,962	236,776	248,532	260,586	272,491
West	103,052	102,991	105,974	107,140	111,610
Pech coal: West	2,013	2,022	2,021	1,943	1,942
Greece: Lignite	1,315	1,676	2,747	2,760	2,853
Hungary:					
Bituminous	2,895	3,014	3,138	3,385	3,685
Lignite	23,835	24,934	26,098	27,672	27,901
Ireland: Bituminous and anthracite	225	258	229	224	225
Italy:					
Bituminous and anthracite	798	815	812	817	763
Lignite	916	1,347	875	1,661	1,958
Netherlands:					
Bituminous and anthracite	13,095	13,203	13,777	13,912	12,757
Lignite	281	219	4	----------	----------
Poland:					
Bituminous	104,699	109,246	115,123	117,513	120,818
Lignite	8,313	10,205	10,281	11,396	12,226
Portugal:					
Anthracite	625	581	480	518	446
Lignite	172	175	172	174	169

See footnotes at end of table.

TABLE 77.—World production of bituminous coal, anthracite, and lignite by countries [1]—Continued

(Thousand short tons)

Country	1958	1959	1960	1961	1962 [2]
Europe—Continued					
Rumania:					
Bituminous and anthracite	331	331	331	331	419
Lignite	7,813	8,462	8,667	9,264	10,151
Spain:					
Bituminous and anthracite	15,922	14,926	15,193	15,207	13,962
Lignite	2,945	2,317	1,942	2,303	2,736
Svalbard (Spitzbergen): Bituminous:					
Controlled by Norway	317	278	445	407	489
Controlled by U.S.S.R.	425	505	529	439	[3] 440
Sweden: Bituminous	352	300	277	220	153
Switzerland: Bituminous and anthracite (including lignite) [3]	11	11	11	11	11
U.S.S.R.: [4]					
Bituminous and anthracite	389,148	402,586	413,284	415,592	421,082
Lignite	157,721	155,851	152,406	147,176	148,812
United Kingdom: Bituminous and anthracite	241,723	230,839	216,838	213,320	221,075
Yugoslavia:					
Bituminous	1,332	1,431	1,414	1,447	1,308
Lignite	19,597	21,836	23,623	25,089	25,912
Total [4]	1,714,694	1,712,173	1,736,870	1,756,942	1,799,195
Asia:					
Afghanistan: Bituminous	37	40	51	75	[3] 74
Burma: Bituminous	----------	1	(5)	2	2
China: Bituminous, anthracite, and lignite	297,600	383,400	463,000	[3] 420,000	[3] 420,000
India:					
Bituminous	50,781	52,690	57,974	61,801	67,616
Lignite	8	36	52	71	231
Indonesia: Bituminous	665	703	725	606	519
Iran: Bituminous [6]	214	261	254	279	220
Japan:					
Bituminous and anthracite	54,756	52,093	56,292	60,058	59,959
Lignite	1,744	1,619	1,552	1,443	1,225
Korea:					
North: Anthracite, bituminous, and lignite	7,586	9,760	11,707	12,996	14,550
Republic of: Anthracite	2,944	4,559	5,897	6,486	8,206
Malaya: Bituminous	75	85	8	----------	----------
Mongolia, Outer: Lignite and bituminous	521	665	682	826	[3] 937
Pakistan: Bituminous and lignite	669	810	916	1,015	1,060
Philippines: Bituminous	119	154	163	168	180
Ryukyu Islands: Bituminous	1	1	1	1	1
Taiwan: Bituminous	3,508	3,928	4,367	4,670	5,020
Thailand: Lignite	140	155	164	119	149
Turkey (mined):					
Bituminous	7,220	7,191	6,952	7,035	[3] 7,110
Lignite	4,212	4,038	3,760	4,159	[3] 4,354
Viet-Nam:					
North: Anthracite	1,700	2,427	2,860	3,100	[3] 2,900
South: Anthracite	22	22	30	63	78
Total [4]	434,522	524,638	617,407	584,973	594,391
Africa:					
Algeria: Bituminous and anthracite	169	134	131	86	83
Congo, Republic of the (formerly Belgian): Bituminous	324	294	180	73	84
Malagasy, Republic of: Bituminous	----------	----------	----------	2	----------
Morocco: Anthracite	562	513	454	452	408
Mozambique: Bituminous	273	283	298	354	328
Nigeria: Bituminous	1,036	831	629	669	699
Rhodesia and Nyasaland, Federation of: Southern Rhodesia: Bituminous	3,897	4,144	3,923	3,387	3,115
South Africa, Republic of: Bituminous and anthracite (marketable)	40,879	40,181	42,078	43,613	45,498
Swaziland: Anthracite and bituminous	----------	1	13	1	----------
Tanganyika: Bituminous	1	2	2	2	3
Total	47,141	46,383	47,708	48,639	50,218

See footnotes at end of table.

TABLE 77.—World production of bituminous coal, anthracite, and lignite by countries[1]—Continued

(Thousand short tons)

Country	1958	1959	1960	1961	1962[2]
Oceania:					
Australia:					
Bituminous	22,895	22,734	25,277	26,857	27,449
Lignite	13,041	14,599	16,763	18,232	19,193
New Zealand:					
Bituminous and anthracite	2,846	2,956	3,194	3,101	2,690
Lignite	201	191	180	175	166
Total	38,983	40,480	45,414	48,365	49,498
Lignite (total of items shown above) (estimate)	676,426	680,506	704,003	729,510	758,936
Bituminous and anthracite (by subtraction)	2,011,811	2,096,231	2,198,256	2,150,531	2,194,301
World total, all grades (estimate)	2,688,237	2,776,737	2,902,259	2,880,041	2,953,237

[1] This table incorporates some revisions.
[2] Preliminary.
[3] Estimate.
[4] Output from U.S.S.R. in Asia (including Sakhalin) included with U.S.S.R. in Europe.
[5] Less than 500 tons.
[6] Year ended March 20 of year following that stated.

Compiled by Virginia G. Huguley, Division of Foreign Activities.

COAL TECHNOLOGY

Seeking to improve the position of coal in the energy market, Government and industry continued research in all phases of coal technology for developing improved methods of mining, preparing, and utilizing coal that included new and expanded uses. For supplementing research by the Bureau of Mines, the Office of Coal Research of the Department of the Interior awarded 12 contracts during 1962 for studies of new methods and products that would lead to increased consumption of coal.

During the year, no major changes were made in design of coal mining equipment, but there were continued improvements to increase capacity and to reduce maintenance. Some transition from dc- to ac-powered underground equipment took place for lowering initial investment and maintenance costs.

Application of longwall mining continued by further development of powered self-advancing roof supports. By the end of 1962, at least four longwall operations were in use in the United States. Under certain mining conditions, the longwall system appears to offer advantages over conventional room-and-pillar mining in increased productivity, better roof control, and decreased maintenance and supply cost.

Strip-mining equipment for removing overburden continued to grow in size. A huge 115-cubic-yard shovel that will strip 100 feet of overburden at a monthly handling rate of 3 million cubic yards was placed in operation at a mine in western Kentucky. Also, an 85-cubic-yard dragline bucket that will be used for removing overburden up to 150 feet thick was placed on order.

Experiments continued using high-pressure jets of water for cutting coal hydraulically. Research by the Bureau of Mines showed that, under certain mining conditions as in removing coal pillars in steeply dipping coalbeds, productivity could be increased as much as 50 percent over conventional mining methods. Hydraulic mining systems also were reported under construction in Japan and in the U.S.S.R. For use in conjunction with hydraulic mining, the Bureau of Mines also studied means for moving coal hydraulically from the coal face to the preparation plant.

In the field of coal preparation, jigs still continued to handle a greater tonnage of coal than any other single type of coal washing equipment, but there was a growing preference for dense-medium cleaning. Tables continued to be the first choice for cleaning coal finer than ⅜-inch, with the dense-medium cyclone making impressive strides. Because of the economic necessity for increased coal recovery as well as more vigorous enforcement of stream-pollution laws, increasing attention was given to the processing of fine coal; for example, sizes below 28 mesh. Flotation is the principal method for treating this fine material. In recovery of flotation coal, the Bureau of Mines found that steam and radiant heating assisted materially in dewatering filter cake by vacuum filtration. A new method was placed in operation at a mine in western Pennsylvania whereby the filter cake is mixed with lignin, the mixture formed into pellets in a rotating drum, and the dried pellets mixed and loaded with the ⅜-inch by 0 coal.

Significant progress continued in reducing transportation costs of coal. Because of the demonstrated feasibility of moving coal in a water slurry through pipelines, legislation was introduced in Congress for the right of eminent domain for construction of interstate coal pipelines. To meet this potential competition, the railroads introduced the concept of the "integral train" for moving coal from the producer to the consumer which included design of new cars and rapid loading and unloading facilities. With this new idea of bulk transportation, better efficiencies were achieved that resulted in substantially reduced railroad freight rates. Another promising technologic innovation was the development of methods for transmitting electricity at extra-high voltages—as much as 500,000 volts or more—from mine-mouth generating plants. The Bonneville Power Administration, the Tennessee Valley Authority in cooperation with a group of surrounding utilities, and several private utilities in Pennsylvania, Virginia, and West Virginia all began the planning or construction of 500,000-volt circuits. The possibility of extra-high-voltage dc transmission that theoretically offers advantages over ac transmission also was explored.

Steam generating units continued to grow in size with a contract awarded for the largest unit ever ordered. At full output, the generator will deliver 6,500,000 pounds of steam per hour to the turbine at a pressure of 2,400 pounds per square inch. The turbine will have a capability of generating over a million kilowatts of electricity.

Basic studies were made of pulverized-coal flames including shape of the flame, progress of combustion, and influence of coal and burner characteristics. Studies also were made by the Bureau of Mines using model furnaces with light simulating radiant heat.

Investigation of magnetohydrodynamics and its application to generation of electric power continued. In this connection, the

Bureau of Mines began an investigation of the effect of ash components on erosion and corrosion problems associated with this high-temperature combustion process.

The Union Pacific Railroad started tests of its experimental direct-fired coal-burning gas turbine for driving electric locomotives. An experimental gas producer was designed by Russian investigators to produce drive gas for a standard liquid-fuel turbine rather than using direct firing of the turbine with pulverized coal. Efficiency of the producer with a 50-kilowatt turbine was calculated to be 32.5 percent.

Work progressed both experimentally and industrially in injection of natural gas, oil, coal, and mixtures of them into blast furnaces as partial replacement of the coke required in making pig iron. Production rates as high as 4,000 tons per day of hot metal were predicted for some blast furnaces by the end of the decade using various improvements. They include higher blast temperatures with supplemental fuel injection at the tuyeres, more flux in agglomerates, greater uniformity in quality and size of coke and iron-bearing materials, increase in top pressure, and oxygen enrichment of the blast. The Bureau of Mines increased the rate of production of pig iron by 35 percent in experimental blast furnace tests by using iron ore pellets made by a new process; lignite was used as the reductant, but other solid fuels could be used.

Two processes for converting coal to chemical coke without using conventional coke ovens were reported successful. One uses a rotary furnace based on the principal of a chain-grate stoker; the other makes "formed" coke from noncoking coal by a combination of carbonization and briquetting.

Interest continued in gasification of coal to synthesis gas that can be used as a fuel, a source of coal chemicals, and upgrading to high-Btu gas. Much of the research was in efforts to improve the economics of making high-Btu gas for use as a substitute for natural gas.

Special chemicals or material derived from coal continued to receive attention. Centre d'Études et Recherche des Charbonnages de France (CERCHAR) reported the development of a process for producing a powerful jet fuel by catalytic hydrogenation of a high-temperature coal tar fraction. A 10,000 ton per year plant in Wyoming was extracting humic acid from leonardite (oxidized lignite) for use as a soil conditioner-fertilizer in combination with added plant nutrients. A somewhat similar product also was marketed in Japan. Other reported nonfuel applications of coal included use of coal fines as a rubber filler, as a source of coal chemicals to make synthetic rubber, and as a source of uranium by extraction from certain lignites. Some work was reported in converting coal to useful chemical products and fuels by reaction of coal with hydrogen and other gases under influence of various forms of electric discharge.

Coal technology activities of the Bureau of Mines are reviewed in a separate report published annually.

Coal—Pennsylvania Anthracite

By J. A. Vaughan,[1] and Marian I. Cooke [2]

Contents

Page
General summary 165
Scope of report 171
Acknowledgments 172
Production, mining methods, and equipment 172
Prices and value of sales 190
Employment 195
Distribution 195
Consumption 201
Stocks 203
Foreign trade 204
World production 204
Technology 207

GENERAL SUMMARY

PRODUCTION of Pennsylvania anthracite in 1962 totaled 16.9 million net, or short, tons, a decline of 3 percent from 1961. Of this total, 40 percent was produced at underground mines, 40 percent at strip pits, 16 percent from culm and silt banks, and 4 percent by dredging operations. When compared with tonnages produced in 1961, underground production declined 2 percent, strip pits 6 percent, dredges 3 percent, and culm and silt remained about the same.

The total value of the 1962 output was $134.1 million, 4 percent less than in 1961. Production of Pea and larger sizes declined 5 percent and the Buckwheat No. 1 and smaller category, 3 percent, from 1961. Although the large sizes amounted to only 41 percent of the year's output (42 percent in 1961), they accounted for relatively more of the industry's total revenue than in 1961 because of the higher prices received. For example, the Pea and larger size group averaged $10.90 per net ton, a gain of $0.10, but the average for Buckwheat No. 1 and smaller ($5.93) was $0.16 less. Consequently, the average value for all sizes dropped to $7.98 per ton, or $0.07 less.

Apparent consumption of anthracite in the United States in 1962 was estimated at 15 million tons—6 percent below 1961. No conclusive data are available on the subject; however, a large part of the decline in consumption undoubtedly was attributable to further losses in the space-heating market, because deliveries by retail dealers fell 6 percent. Also, demand for the smaller industrial sizes, as measured by shipments, was apparently little changed from 1961. Consumption of anthracite by the iron and steel industry was virtually the same, since a gain in the quantity used in manufacturing coke almost equalled the decline in the tonnage used by the industry for sintering and pelletizing iron ore and other purposes.

---

[1] Commodity industry analyst.
[2] Commodity research assistant.

Exports totaled 1.9 million tons, or 30 percent more than in 1961. Shipments to Canada declined 8 percent, but exports to Western Europe almost quadrupled as large shipments of Egg and Stove coal continued to move to West Germany for use by U.S. armed forces (694,000 tons, according to the Association of American Railroads) and each of the other importing countries took substantially more coal than in 1961.

Although the anthracite industry was active on more days than in 1961, the total labor force declined 11 percent to an average of 14,010 men working daily as the result of further mine closures and curtailments in the labor forces of other operations. As the reduced force worked an average of 204 days—only 8 more than in 1961—the total number of man-days worked declined to 2.9 million, or 8 percent less than in 1961. The productivity rate again established a new record, 5.92 tons per man-day against 5.63 tons in 1961, the former record.

Based on combined fatal and nonfatal injuries, the overall injury rate in the anthracite industry declined to 56.14 per million man-hours, as compared with the rate of 58.60 in 1961. Although 26 men lost their lives at anthracite operations—a frequency rate of 1.26 as compared with 0.85 in 1961—the number of nonfatal injuries declined from 1,295 in 1961 to 1,161 in 1962, and the rate, from 57.75 to 56.14 per million man-hours.

Salient annual statistics are presented in table 1 for 1958–62, and monthly developments in the Pennsylvania anthracite industry are shown in table 2. Table 3 presents selected historical data for 1925–62.

TABLE 1.—Salient statistics of the Pennsylvania anthracite industry, 1958–62

	1958	1959	1960	1961	1962
Production:					
Preparation plants net tons	20,284,823	19,804,532	18,003,730	16,655,847	16,015,366
Dredges do	691,368	716,169	711,713	745,498	726,666
Used at collieries for power and heat net tons	194,951	128,585	101,998	45,094	151,614
Total production do	21,171,142	20,649,286	18,817,441	17,446,439	16,893,646
Value of production	$187,898,316	$172,319,913	$147,116,250	$140,337,541	$134,093,874
Average sales realization per net ton on preparation plant shipments (excludes dredge coal):					
Pea and larger	$11.80	$11.04	$10.42	$10.80	$10.90
Buckwheat No. 1 and smaller	$6.80	$6.60	$6.27	$6.32	$6.14
All sizes	$9.14	$8.55	$8.01	$8.26	$7.99
Percentage of total preparation plant shipments (excludes dredge coal):					
Pea and larger	46.7	43.8	42.0	43.4	43.1
Buckwheat No. 1 and smaller	53.3	56.2	58.0	56.6	56.9
Producers' stocks at end of year [1] net tons	406,375	429,020	199,356	232,520	(2)
Exports [3] do	2,279,859	1,787,558	1,440,400	[4] 1,435,335	[5] 1,869,408
Imports [3] do	4,363	2,633	1,476	792	7,583
Consumption (apparent) do	19,000,000	18,800,000	17,600,000	15,900,000	15,000,000
Average number of days worked	183	173	176	196	204
Average number of men working daily	26,540	23,294	19,051	15,792	14,010
Output per man per day do	4.36	5.12	5.60	5.63	5.92
Output per man per year do	798	886	986	1,103	1,208
Quantity cut by machines do	184,028	260,502	225,520	236,166	277,537
Quantity mined by stripping do	6,877,761	7,096,343	7,112,288	7,246,646	6,822,207
Quantity loaded by machines underground net tons	5,332,043	4,700,542	4,044,392	3,377,778	3,065,364
Distribution:					
Total receipts in New England [6] do	1,012,035	869,166	697,353	634,435	495,390
Exports to Canada [3] do	1,522,408	1,453,228	1,204,414	965,576	892,488
Loaded into vessels at Lake Erie [7] do	260,050	329,204	244,468	221,435	196,440
Receipts at Duluth-Superior [8] do	[4] 93,495	[4] 71,845	65,713	[4] 33,474	43,094

---

[1] Anthracite Committee.

[2] This series discontinued.

[3] U.S. Department of Commerce.

[4] Revised.

[5] See NOTE, table 34.

[6] Commonwealth of Massachusetts, Division on the Necessaries of Life, and Association of American Railroads.

[7] Ore and Coal Exchange, Cleveland, Ohio.

[8] Lake Superior Area Office, Corps of Engineers, U.S. Army, Duluth, Minn.

TABLE 2.—Statistical summary of monthly developments

(Net tons, except as

	January	February	March	April	May	June
Production (including mine fuel, local sales, and dredge coal)	1,810,000	1,522,000	1,513,000	1,257,000	1,319,000	1,339,000
Shipments (breakers and washeries only, all sizes):						
By Rail [1]	842,480	725,364	662,458	543,635	727,373	881,608
By truck [2]	971,776	868,040	744,621	558,240	484,211	513,604
Carloadings [3]	15,774	13,525	13,597	12,171	14,238	16,883
Distribution:						
Lake Erie loadings [4]	----------	----------	----------	9,917	18,610	22,384
Lake Ontario loadings [5]	----------	----------	----------	----------	3,173	----------
Receipts at Duluth-Superior [6]	----------	----------	----------	----------	----------	4,947
Upper Lake dock trade: [7]						
Receipts:						
Lake Superior	----------	----------	----------	----------	----------	----------
Lake Michigan	1,814	1,348	857	8,583	510	426
Deliveries (reloadings):						
Lake Superior	4,492	3,632	3,610	1,577	1,262	96
Lake Michigan	3,491	2,568	1,905	1,128	2,029	1,707
New England receipts: By rail [8]	43,564	36,752	27,839	14,362	37,015	55,881
Exports [9]	124,327	98,412	108,143	53,352	112,437	158,934
Imports [9]	230	548	672	665	365	1,129
Industrial consumption and stocks by:						
Electric utilities: [12]						
Consumption	206,427	178,277	181,830	197,289	207,042	187,774
Stocks	1,480,546	1,423,311	1,428,636	1,423,629	1,434,218	1,408,899
Coke plants:						
Used for carbonizing	35,088	32,070	34,308	34,574	31,497	30,276
Stocks	85,037	72,282	58,826	51,201	52,181	52,652
Stocks on Upper Lake docks: [7]						
Lake Superior	18,128	14,544	10,968	5,422	4,160	4,064
Lake Michigan	13,743	12,523	11,475	18,857	17,339	16,058
Producers' stocks [13]	193,114	158,790	149,082	155,617	192,754	217,096
Stocks in retail dealer yards [16]	582,000	487,000	414,000	426,000	489,000	598,000
Retail dealer deliveries [16]	610,000	537,000	426,000	219,000	206,000	274,000
Wholesale price indexes (1957–59=100): [17] f.o.b. mines:						
Chestnut	97.0	97.0	97.0	83.6	83.6	83.6
Pea	96.7	96.7	96.7	88.3	88.3	88.3
Buckwheat No. 1	96.7	96.7	96.7	87.3	87.3	87.3
Buckwheat No. 3	108.8	108.8	108.8	106.0	106.0	106.0

---

[1] Furnished by Anthracite Institute.
[2] Pennsylvania Department of Mines and Mineral Industries.
[3] Association of American Railroads.
[4] Ore and Coal Exchange, Cleveland, Ohio.
[5] Buffalo Branch, Ore and Coal Exchange, Cleveland, Ohio.
[6] Lake Superior Area Office, Corps of Engineers, U.S. Army, Duluth, Minn.
[7] Includes all commercial docks on Lake Superior and west shore of Lake Michigan as far south as Kenosha. Data supplied by Upper Lake Docks Coal Bureau, Inc., and direct reports to the Bureau of Mines.
[8] Furnished by Commonwealth of Massachusetts, Division on the Necessaries of Life.
[9] U.S. Department of Commerce.
[10] See NOTE, table 34

in the Pennsylvania anthracite industry in 1962
otherwise indicated)

July	August	September	October	November	December	Year 1962	Change from 1961 (percent)	Year 1961
906,000	1,328,000	1,193,000	1,528,000	1,664,000	1,515,000	16,894,000	−3.2	17,446,000
556,541	877,418	745,166	922,355	903,125	805,806	9,193,329	+1.3	9,071,785
446,939	538,710	558,908	674,352	785,372	853,423	7,998,196	−7.5	8,642,551
11,787	16,868	14,743	17,825	17,313	14,280	179,004	−4.3	186,964
22,280	12,192	39,403	32,116	39,538	-----------	196,440	−11.3	221,435
3,169	3,699	6,100	7,225	10,150	-----------	33,516	+73.0	19,376
-----------	8,515	9,657	19,975	-----------	-----------	43,094	+28.7	33,474
-----------	8,567	13,946	3,819	-----------	-----------	26,332	−1.4	26,708
445	357	428	1,110	684	1,296	17,858	−33.7	26,950
37	5,948	3,908	4,990	2,954	899	33,405	−38.7	54,520
1,756	1,740	1,693	2,207	1,760	2,340	24,324	−32.2	35,856
40,644	44,674	40,645	59,462	53,503	41,049	495,390	−21.9	634,435
162,429	226,451	173,370	227,768	208,339	215,446	[10] 1,869,408	+30.2	[11] 1,435,335
1,386	461	1,254	357	452	64	7,583	+857.4	792
177,544	201,388	181,368	194,731	189,419	193,760	2,296,849	−8.5	2,509,153
1,503,288	1,512,721	1,526,064	1,503,858	1,524,979	1,430,716	1,430,716	−2.0	1,459,790
30,640	34,611	35,028	39,638	38,742	43,048	419,520	+31.0	320,125
61,979	71,150	88,897	101,987	122,315	115,338	115,338	+17.2	98,381
3,993	6,607	16,692	15,603	12,650	11,794	11,794	−47.9	22,628
14,747	13,386	12,121	11,024	9,976	8,894	8,894	−42.3	15,420
194,914	170,763	158,690	123,817	(14)	(14)	(14)	(15)	232,520
625,000	664,000	638,000	633,000	622,000	531,000	531,000	−25.7	715,000
319,000	382,000	420,000	457,000	407,000	510,000	4,767,000	−6.0	5,070,000
87.0	87.0	90.4	93.8	93.8	97.0	90.9	(15)	(18)
90.4	90.4	92.2	94.4	94.4	96.5	92.8	(15)	(18)
89.6	89.6	91.6	93.9	93.9	96.2	92.2	(15)	(18)
106.0	106.0	108.3	108.8	108.8	109.2	107.6	(15)	(18)

---

[11] Revised.
[12] Federal Power Commission.
[13] Anthracite Committee. Represents coal in ground storage on nearest available date to end of month.
[14] This series discontinued with October 1962.
[15] Not available.
[16] Estimated from reports submitted by a selected list of retail dealers. Does not include local sales.
[17] Bureau of Labor Statistics. Based on data obtained from authorized trade publications.
[18] Comparable data not available.

TABLE 3.—Trends in the Pennsylvania anthracite industry

	Production (net tons)	Value of production	Average value per net ton	Exports[1] (net tons)	Imports[1] (net tons)	Apparent consumption (net tons)	Average number of employees	Average number of days worked	Average tons per man per day	Average tons per man per year	Quantity cut by machines (net tons)	Quantity produced by stripping (net tons)	Quantity loaded mechanically underground[2] (net tons)
1925	61,817,149	$327,664,512	$5.30	3,179,006	382,894	64,061,000	160,312	182	2.12	386	941,189	1,578,478	-------------
1926	84,437,452	474,164,252	5.62	4,029,683	813,956	77,221,000	165,386	244	2.09	511	931,650	2,401,356	-------------
1927	80,095,564	420,941,726	5.26	3,325,507	119,030	74,672,000	165,259	225	2.15	485	1,171,888	2,153,156	[3] 2,223,281
1928	75,348,069	393,637,690	5.22	3,336,272	384,707	73,650,000	160,681	217	2.17	469	1,289,809	2,422,924	[3] 2,351,074
1929	73,828,195	385,642,751	5.22	3,406,369	487,172	71,457,000	151,501	225	2.16	487	1,159,910	1,911,766	3,470,158
1930	69,384,837	354,574,191	5.11	2,551,659	674,812	67,628,000	150,804	208	2.21	460	1,410,123	2,536,288	4,467,750
1931	59,645,652	296,354,586	4.97	1,778,308	637,951	58,408,000	139,431	181	2.37	428	1,587,265	3,813,237	4,384,780
1932	49,855,221	222,375,129	4.46	1,303,355	607,097	50,500,000	121,243	162	2.54	411	1,674,223	3,980,973	5,433,340
1933	49,541,344	206,718,405	4.17	1,034,562	456,252	49,600,000	104,633	182	2.60	473	1,648,249	4,932,069	6,557,267
1934	57,168,291	244,152,245	4.27	1,297,610	478,118	55,500,000	109,050	207	2.53	524	1,981,088	5,798,138	9,284,486
1935	52,158,783	210,130,565	4.03	1,608,549	571,439	51,100,000	103,269	189	2.68	505	1,848,095	5,187,072	9,279,057
1936	54,579,535	227,003,538	4.16	1,678,024	614,639	53,200,000	102,081	192	2.79	535	2,162,744	6,203,267	10,827,946
1937	51,856,433	197,598,849	3.81	1,914,173	395,737	50,400,000	99,085	189	2.77	523	1,984,512	5,696,018	10,683,837
1938	46,099,027	180,600,167	3.92	1,908,911	362,895	45,200,000	96,417	171	2.79	478	1,588,407	5,095,341	10,151,669
1939	51,487,377	187,175,324	3.64	2,590,000	298,153	49,700,000	93,138	183	3.02	553	1,881,884	5,486,479	11,773,833
1940	51,484,640	205,489,814	3.99	2,667,632	135,436	49,000,000	91,313	186	3.02	562	1,816,483	6,352,700	12,326,000
1941	[4] 56,368,267	240,275,126	4.26	3,380,189	74,669	52,700,000	88,054	203	[5] 3.04	[5] 617	1,855,422	7,316,574	13,441,987
1942	[4] 60,327,729	271,673,380	4.50	4,438,588	140,115	56,500,000	82,121	239	[5] 2.95	[5] 705	2,285,640	9,070,933	14,741,459
1943	[4] 60,643,620	306,816,018	5.06	4,138,680	166,020	57,100,000	79,153	270	[5] 2.78	[5] 751	1,624,883	8,989,387	14,745,793
1944	[4] 63,701,363	354,582,884	5.57	4,185,933	11,847	59,400,000	77,591	292	[5] 2.79	[5] 815	1,336,082	10,953,030	14,975,146
1945	[4] 54,933,909	323,944,435	5.90	3,691,247	149	51,600,000	72,842	269	[5] 2.79	[5] 751	1,210,171	10,056,325	13,927,955
1946	[4] 60,506,873	413,417,070	6.83	6,497,245	9,556	53,900,000	78,145	271	[5] 2.84	[5] 770	1,232,828	12,858,930	15,619,162
1947	[4] 57,190,009	413,019,486	7.22	8,509,995	10,350	48,200,000	78,600	259	[5] 2.78	[5] 720	1,209,983	12,603,545	16,054,011
1948	[4] 57,139,948	467,051,800	8.17	6,675,914	945	50,200,000	76,215	265	[5] 2.81	[5] 745	1,016,757	13,352,874	15,742,368
1949	[4] 42,701,724	358,008,451	8.38	4,942,670	----------	37,700,000	75,377	195	[5] 2.87	[5] 560	557,599	10,376,808	11,858,088
1950	[4] 44,076,703	392,398,006	8.90	3,891,569	18,289	39,900,000	72,624	211	[5] 2.83	[5] 597	611,734	11,833,934	12,335,650
1951 [6]	42,669,997	405,817,963	9.51	5,955,535	26,812	37,000,000	68,995	208	2.97	618	496,085	11,135,990	10,847,787
1952	40,582,558	379,714,076	9.36	4,592,060	29,370	35,300,000	65,923	201	3.06	615	386,128	10,696,705	10,034,464
1953	30,949,152	299,139,687	9.67	2,724,270	31,443	28,000,000	57,862	163	3.28	535	318,699	8,606,482	6,838,769
1954	29,083,477	247,870,023	8.52	2,851,239	5,831	26,900,000	43,996	164	4.02	659	381,424	7,939,680	6,978,035
1955	26,204,554	206,096,662	7.86	3,152,313	170	23,600,000	[7] 33,523	[7] 197	[7] 3.96	[7] 780	393,932	7,703,907	6,660,939
1956	28,900,220	236,785,062	8.19	5,244,349	46	24,000,000	31,516	216	4.25	918	400,402	8,354,230	7,308,110
1957	25,338,321	227,753,802	8.99	4,331,785	1,138	20,800,000	30,825	196	4.18	819	292,307	7,543,157	6,657,479
1958	21,171,142	187,898,316	8.88	2,279,859	4,363	19,000,000	26,540	183	4.36	798	184,028	6,877,761	5,332,043
1959	20,649,286	172,319,913	8.35	1,787,558	2,633	18,800,000	23,294	173	5.12	886	260,502	7,096,343	4,700,542
1960	18,817,441	147,116,250	7.82	1,440,400	1 476	17,600,000	19,051	176	5.60	986	225,520	7,112,288	4,044,392
1961	17,446,439	140,337,541	8.04	[8] 1,435,335	792	15,900,000	15,792	196	5.63	1,103	236,166	7,246,646	3,377,778
1962	16,893,646	134,093,874	7.94	[9] 1,869,408	7,583	15,000,000	14,010	204	5.92	1,208	277,537	6,822,207	3,065,364

[1] U.S. Department of Commerce.
[2] Data first collected in 1929.
[3] As reported by the Commonwealth of Pennsylvania, Department of Mines.
[4] Includes some "bootleg" coal purchased by authorized operators and prepared at their breakers.
[5] Output per man calculated on authorized tonnages only; bootleg purchases excluded.
[6] Figures for 1951 and subsequent years are not strictly comparable with previous years. See Production and Employment sections, Coal—Pennsylvania Anthracite, Volume II, Minerals Yearbook, 1951.
[7] Estimated.
[8] Revised.
[9] See NOTE, table 34.

SCOPE OF REPORT

The data in this chapter dealing with U.S. coal refer only to the anthracite, or hard coal, produced in the northeastern part of the Commonwealth of Pennsylvania. Geologically, the anthracite region is composed of four producing fields: The Northern, Eastern Middle, Western Middle, and Southern. The area is also divided by coal-trade usage into three regions: Wyoming, Lehigh, and Schuylkill. The production of semianthracite in the States of Arkansas, Colorado, New Mexico, Virginia, and Washington is included with bituminous coal in the Bituminous Coal and Lignite chapter of the Minerals Yearbook.

Statistics on anthracite production and value are compiled almost entirely from reports submitted voluntarily to the Bureau of Mines by preparation plants and dredges. From questionnaires sent to operators of underground mines, strip pits, and culm or silt banks additional data are obtained on run-of-mine production, names of preparation plants to which raw coal is shipped for cleaning and sizing, number and types of equipment used, and other data. From the information submitted by producers of run-of-mine coal, the Bureau is able to allocate production to counties, fields, and regions of origin. Also, by cross-checking the reports of run-of-mine producers with those of preparation plants, duplicate reporting is eliminated and maximum coverage is obtained. For unreported production (usually less than 2 percent) the Bureau prepares estimates based on data released by the Anthracite Committee and the Pennsylvania Department of Mines and Mineral Industries.

For calendar years 1961 and 1962, commercial production data are presented by carrier method (rail and truck) rather than as "local sales" and shipments to points outside the producing region, thus terminating the comparability of the shipment data. Since 1956, data on employment in the anthracite industry have been compiled from the Bureau of Mines questionnaire, Mine Injuries and Employment—Pennsylvania Anthracite, to lessen the reporting burden of respondents. The employment data include production, development, maintenance, repair, supervisory and technical personnel, and those owners or firm members who actually produce coal but exclude sales and office personnel and others not directly engaged in production activities.

Data on the distribution of Pennsylvania anthracite are collected by the Bureau from producers, wholesalers, sales agents, and dock operators on the basis of the coal year (April 1–March 31). The distribution reports present data on shipments by sizes and method of movement to selected cities in the United States and Canada. Copies may be obtained by writing to the Bureau of Mines, U.S. Department of the Interior, Washington, D.C., 20402.

ACKNOWLEDGMENTS

As Bureau of Mines canvasses of the Pennsylvania anthracite industry are limited to questions relating to production by sizes, carrier method, f.o.b. preparation-plant values, employment, injuries, equipment, distribution, and retail-dealer stocks and deliveries, the authors of this chapter have made free use of data from various other sources. Such organizations as the Pennsylvania Department of Mines and Mineral Industries, the Anthracite Committee, the Anthracite Institute, the Association of American Railroads, Commonwealth of Massachusetts, Upper Lake Docks Coal Bureau, Incorporated, and the Ore and Coal Exchange are among many to whom the Bureau would like to offer its thanks. The Bureau is grateful also for the continued cooperation of the hundreds of anthracite producers who voluntarily submit annual reports. Without their assistance it would have been impossible to prepare this chapter.

Production data for 1962 were collected, edited, and tabulated by Ruth A. Cooper and Kathryn S. Huling under the supervision of C. S. Kuebler, Research Director, Anthracite Research Center, Schuylkill Haven, Pa.

PRODUCTION, MINING METHODS, AND EQUIPMENT

Production of Pennsylvania anthracite totaled 16.9 million short tons in 1962, a decrease of 3 percent or slightly more than one-half million tons from 1961. Of this total, 40 percent was produced at underground mines (39 percent in 1961); 40 percent from strip pits (42 percent in 1961); 16 percent from culm and silt banks (15 percent in 1961); and 4 percent from dredging operations (the same as in 1961). The decline in strip-pit production and the relative stability of output from underground mines in 1962 might well be indications that the industry will be forced to place more emphasis in the future upon underground mining. This possibility is also bolstered by the rapidity with which the economically recoverable banks and stripping reserves are being exhausted.

The Lehigh and Wyoming regions showed gains in output in 1962. In the Lehigh region, total production exceeded that of 1961 by 9 percent, primarily because of an increase of more than 300,000 tons in the output of culm-bank coal; in the Wyoming region, total output increased 2 percent—despite a decline of 5 percent in underground production—owing to gains of 10 percent in strip and 18 percent in culm-bank tonnage. Production in the Schuylkill region fell 10 percent below the 1961 level because of sharp declines in production from strip pits and culm banks. As a result of these changes from the 1961 production pattern, the Schuylkill region's share of the industry total dropped from 51 percent in 1961 to 48 percent in 1962, while the portion contributed by the Wyoming region increased from 32 to 33 percent and the Lehigh's from 17 to 19 percent.

The changes in regional output, resulted, of course, from variations in production totals for the major producing counties. In the Wyoming region, production fell 7 percent in Lackawanna County, but the increase of 8 percent in Luzerne County was sufficient to boost the regional total above that of 1961. Similarly, in the Lehigh region the gain of 9 percent over 1961 was attributable to an increase of 22 percent in the output of Carbon County and the gain in Luzerne County. Declines in Schuylkill, Northumberland, and Columbia Counties, resulted in a decrease of 10 percent in the Schuylkill region. Production data by counties, regions, and fields are presented in tables 4, 7, and 9. Figure 1 presents anthracite shipments by regions.

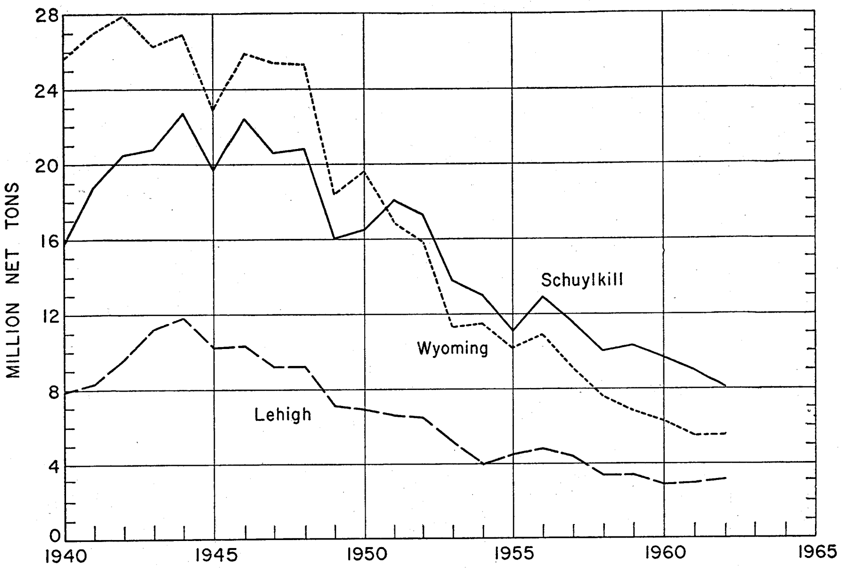


FIGURE 1.—Pennsylvania anthracite shipped from the Lehigh, Schuylkill, and Wyoming regions, 1940–62.

TABLE 4.—Commercial production of Pennsylvania anthracite in 1962, by regions and sizes

Size	From preparation plants								
	Lehigh region			Schuylkill region			Wyoming region [1]		
	Rail	Truck	Total	Rail	Truck	Total	Rail	Truck	Total
NET TONS									
Lump [2] and Broken	------	------	------	202	968	1,170	1,125	509	1,634
Egg	92,932	4,739	97,671	60,281	4,682	64,963	236,108	8,080	244,188
Stove	243,957	94,969	338,926	412,173	479,580	891,753	690,867	183,096	873,963
Chestnut	136,201	258,901	395,102	380,017	744,199	1,124,216	521,459	461,625	983,084
Pea	93,980	245,984	339,964	300,108	483,037	783,145	232,195	533,414	765,609
Total Pea and larger	567,070	604,593	1,171,663	1,152,781	1,712,466	2,865,247	1,681,754	1,186,724	2,868,478
Buckwheat No. 1	121,108	225,833	346,941	390,970	516,168	907,138	346,813	492,897	839,710
Buckwheat No. 2 (Rice)	67,624	202,153	269,777	235,124	458,304	693,428	183,484	321,645	505,129
Buckwheat No. 3 (Barley)	85,956	191,866	277,822	329,502	487,554	817,056	366,353	215,992	582,345
Buckwheat No. 4	159,891	53,706	213,597	299,969	224,686	524,655	97,752	30,786	128,538
Buckwheat No. 5	319,422	16,092	335,514	590,126	337,560	927,686	190,054	77,925	267,979
Other [3]	24,799	514,417	539,216	126,407	449,487	575,894	15,000	342,553	357,553
Total Buckwheat No. 1 and smaller	778,800	1,204,067	1,982,867	1,972,098	2,473,759	4,445,857	1,199,456	1,481,798	2,681,254
Grand total	1,345,870	1,808,660	3,154,530	3,124,879	4,186,225	7,311,104	2,881,210	2,668,522	5,549,732
VALUE									
Lump [2] and Broken	------	------	------	$2,337	$10,926	$13,263	$12,443	$5,630	$18,073
Egg	$1,024,260	$52,373	$1,076,633	664,969	50,416	715,385	2,646,967	89,814	2,736,781
Stove	2,765,969	1,118,347	3,884,316	4,527,119	5,216,284	9,743,403	7,979,652	2,146,052	10,125,704
Chestnut	1,562,646	3,086,053	4,648,699	4,224,895	8,105,236	12,330,131	6,183,703	5,591,091	11,774,794
Pea	831,943	2,348,975	3,180,918	2,627,431	4,262,103	6,889,534	2,356,202	5,758,656	8,114,858
Total Pea and larger	6,184,818	6,605,748	12,790,566	12,046,751	17,644,965	29,691,716	19,178,967	13,591,243	32,770,210
Buckwheat No. 1	908,278	1,876,188	2,784,466	3,165,895	4,168,900	7,334,795	2,900,586	4,539,695	7,440,281
Buckwheat No. 2 (Rice)	519,326	1,853,859	2,373,185	1,862,315	3,680,932	5,543,247	1,615,111	2,906,554	4,521,665
Buckwheat No. 3 (Barley)	577,967	1,278,420	1,856,387	2,224,006	3,122,508	5,346,514	2,468,824	1,472,446	3,941,270
Buckwheat No. 4	777,566	277,553	1,055,119	1,365,077	1,039,247	2,404,324	531,694	149,117	680,811
Buckwheat No. 5	1,582,839	75,496	1,658,335	2,528,507	1,326,515	3,855,022	883,214	353,365	1,236,579
Other [3]	84,287	1,003,063	1,087,350	519,197	1,465,158	1,984,355	28,500	764,296	792,796
Total Buckwheat No. 1 and smaller	4,450,263	6,364,579	10,814,842	11,664,997	14,803,260	26,468,257	8,427,929	10,185,473	18,613,402
Grand total	10,635,081	12,970,327	23,605,408	23,711,748	32,448,225	56,159,973	27,606,896	23,776,716	51,383,612

AVERAGE VALUE PER TON									
Lump [2] and Broken	--------	--------	--------	11.57	11.29	11.34	11.06	11.06	11.06
Egg	11.02	11.05	11.02	11.03	10.77	11.01	11.21	11.12	11.21
Stove	11.34	11.78	11.46	10.98	10.88	10.93	11.55	11.72	11.59
Chestnut	11.47	11.92	11.77	11.12	10.89	10.97	11.86	12.11	11.98
Pea	8.85	9.55	9.36	8.75	8.82	8.80	10.15	10.80	10.60
Total Pea and larger	10.91	10.93	10.92	10.45	10.30	10.36	11.40	11.45	11.42
Buckwheat No. 1	7.50	8.31	8.03	8.10	8.08	8.09	8.36	9.21	8.86
Buckwheat No. 2 (Rice)	7.68	9.17	8.80	7.92	8.03	7.99	8.80	9.04	8.95
Buckwheat No. 3 (Barley)	6.72	6.66	6.68	6.75	6.40	6.54	6.74	6.82	6.77
Buckwheat No. 4	4.86	5.17	4.94	4.55	4.63	4.58	5.44	4.84	5.30
Buckwheat No. 5	4.96	4.69	4.94	4.28	3.93	4.16	4.65	4.53	4.61
Other [3]	3.40	1.95	2.02	4.11	3.26	3.45	1.90	2.23	2.22
Total Buckwheat No. 1 and smaller	5.71	5.29	5.45	5.92	5.98	5.95	7.03	6.87	6.94
Grand total	7.90	7.17	7.48	7.59	7.75	7.68	9.58	8.91	9.26

See footnotes at end of table.

TABLE 4.—Commercial production of Pennsylvania anthracite in 1962, by regions and sizes—Continued

Size	Total preparation plants			From river dredging			Total		
	Rail	Truck	Total	Rail	Truck	Total	Rail	Truck	Total
NET TONS									
Lump [2] and Broken	1,327	1,477	2,804	--------	--------	--------	1,327	1,477	2,804
Egg	389,321	17,501	406,822	--------	--------	--------	389,321	17,501	406,822
Stove	1,346,997	757,645	2,104,642	--------	--------	--------	1,346,997	757,645	2,104,642
Chestnut	1,037,677	1,464,725	2,502,402	--------	3	3	1,037,677	1,464,728	2,502,405
Pea	626,283	1,262,435	1,888,718	--------	149	149	626,283	1,262,584	1,888,867
Total Pea and larger	3,401,605	3,503,783	6,905,388	--------	152	152	3,401,605	3,503,935	6,905,540
Buckwheat No. 1	858,891	1,234,898	2,093,789	--------	365	365	858,891	1,235,263	2,094,154
Buckwheat No. 2 (Rice)	486,232	982,102	1,468,334	--------	1,163	1,163	486,232	983,265	1,469,497
Buckwheat No. 3 (Barley)	781,811	895,412	1,677,223	3,086	3,298	6,384	784,897	898,710	1,683,607
Buckwheat No. 4	557,612	309,178	866,790	--------	25,440	25,440	557,612	334,618	892,230
Buckwheat No. 5	1,099,602	431,577	1,531,179	4,250	26,055	30,305	1,103,852	457,632	1,561,484
Other [3]	166,206	1,306,457	1,472,663	573,427	89,430	662,857	739,633	1,395,887	2,135,520
Total Buckwheat No. 1 and smaller	3,950,354	5,159,624	9,109,978	580,763	145,751	726,514	4,531,117	5,305,375	9,836,492
Grand total	7,351,959	8,663,407	16,015,366	580,763	145,903	726,666	7,932,722	8,809,310	16,742,032
VALUE									
Lump [2] and Broken	$14,780	$16,556	$31,336	--------	--------	--------	$14,780	$16,556	$31,336
Egg	4,336,196	192,603	4,528,799	--------	--------	--------	4,336,196	192,603	4,528,799
Stove	15,272,740	8,480,683	23,753,423	--------	--------	--------	15,272,740	8,480,683	23,753,423
Chestnut	11,971,244	16,782,380	28,753,624	--------	$27	$27	11,971,244	16,782,407	28,753,651
Pea	5,815,576	12,369,734	18,185,310	--------	1,052	1,052	5,815,576	12,370,786	18,186,362
Total Pea and larger	37,410,536	37,841,956	75,252,492	--------	1,079	1,079	37,410,536	37,843,035	75,253,571
Buckwheat No. 1	6,974,759	10,584,783	17,559,542	--------	2,168	2,168	6,974,759	10,586,951	17,561,710
Buckwheat No. 2 (Rice)	3,996,752	8,441,345	12,438,097	--------	7,170	7,170	3,996,752	8,448,515	12,445,267
Buckwheat No. 3 (Barley)	5,270,797	5,873,374	11,144,171	$20,059	13,576	33,635	5,290,856	5,886,950	11,177,806
Buckwheat No. 4	2,674,337	1,465,917	4,140,254	--------	123,974	123,974	2,674,337	1,589,891	4,264,228
Buckwheat No. 5	4,994,560	1,755,376	6,749,936	15,938	101,467	117,405	5,010,498	1,856,843	6,867,341
Other [3]	631,984	3,232,517	3,864,501	1,911,363	278,038	2,189,401	2,543,347	3,510,555	6,053,902
Total Buckwheat No. 1 and smaller	24,543,189	31,353,312	55,896,501	1,947,360	526,393	2,473,753	26,490,549	31,879,705	58,370,254
Grand total	61,953,725	69,195,268	131,148,993	1,947,360	527,472	2,474,832	63,901,085	69,722,740	133,623,825

AVERAGE VALUE PER TON									
Lump [2] and Broken	11.14	11.21	11.18	-----	-----	-----	11.14	11.21	11.18
Egg	11.14	11.01	11.13	-----	-----	-----	11.14	11.01	11.13
Stove	11.34	11.19	11.29	-----	-----	-----	11.34	11.19	11.29
Chestnut	11.54	11.46	11.49	-----	9.00	9.00	11.54	11.46	11.49
Pea	9.29	9.80	9.63	-----	7.06	7.06	9.29	9.80	9.63
Total Pea and larger	11.00	10.80	10.90	-----	7.10	7.10	11.00	10.80	10.90
Buckwheat No. 1	8.12	8.57	8.39	-----	5.94	5.94	8.12	8.57	8.39
Buckwheat No. 2 (Rice)	8.22	8.60	8.47	-----	6.17	6.17	8.22	8.59	8.47
Buckwheat No. 3 (Barley)	6.74	6.56	6.64	6.50	4.12	5.27	6.74	6.55	6.64
Buckwheat No. 4	4.80	4.74	4.78	-----	4.87	4.87	4.80	4.75	4.78
Buckwheat No. 5	4.54	4.07	4.41	3.75	3.89	3.87	4.54	4.06	4.40
Other [3]	3.80	2.47	2.62	3.33	3.11	3.30	3.44	2.51	2.83
Total Buckwheat No. 1 and smaller	6.21	6.08	6.14	3.35	3.61	3.40	5.85	6.01	5.93
Grand total	8.43	7.99	8.19	3.35	3.62	3.41	8.06	7.91	7.98

---

[1] Includes Sullivan County.
[2] Quantity of Lump included is insignificant.
[3] Includes various mixtures of Buckwheat Nos. 2 to 5 and coal of relatively low dollar value.

TABLE 5.—Sizes of Pennsylvania anthracite prepared at plants in 1962, by regions, in percent of total

(Excludes dredge coal)

Size	Lehigh region			Schuylkill region			Wyoming region [4]			Total		
	Shipped by rail	Shipped by truck	Total	Shipped by rail	Shipped by truck	Total	Shipped by rail	Shipped by truck	Total	Shipped by rail	Shipped by truck	Total
Lump [1] and Broken	--------	--------	--------	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Egg	6.9	0.3	3.1	1.9	0.1	0.9	8.2	0.3	4.4	5.3	0.2	2.5
Stove	18.1	5.2	10.7	13.2	11.5	12.2	24.0	6.9	15.8	18.4	8.7	13.2
Chestnut	10.1	14.3	12.5	12.2	17.8	15.4	18.1	17.3	17.7	14.1	16.9	15.6
Pea	7.0	13.6	10.8	9.6	11.5	10.7	8.1	20.0	13.8	8.5	14.6	11.8
Total Pea and larger	42.1	33.4	37.1	36.9	40.9	39.2	58.4	44.5	51.7	46.3	40.4	43.1
Buckwheat No. 1	9.0	12.5	11.0	12.5	12.3	12.4	12.0	18.5	15.1	11.7	14.3	13.1
Buckwheat No. 2 (Rice)	5.0	11.2	8.6	7.5	11.0	9.5	6.4	12.0	9.1	6.6	11.3	9.2
Buckwheat No. 3 (Barley)	6.4	10.6	8.8	10.5	11.6	11.1	12.7	8.1	10.5	10.6	10.3	10.5
Buckwheat No. 4	11.9	3.0	6.8	9.6	5.4	7.2	3.4	1.2	2.3	7.6	3.6	5.4
Buckwheat No. 5	23.7	0.9	10.6	18.9	8.1	12.7	6.6	2.9	4.8	14.9	5.0	9.5
Other [3]	1.9	28.4	17.1	4.1	10.7	7.9	0.5	12.8	6.5	2.3	15.1	9.2
Total Buckwheat No. 1 and smaller	57.9	66.6	62.9	63.1	59.1	60.8	41.6	55.5	48.3	53.7	59.6	56.9

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.
[3] Includes various mixtures of Buckwheat Nos. 2 to 5 and coal of a relatively low value.
[4] Includes Sullivan County.

TABLE 6.—Sizes of Pennsylvania anthracite prepared at plants, by regions, in percent of total

(Excludes dredge coal)

Size	Lehigh region					Schuylkill region				
	1958	1959	1960	1961	1962	1958	1959	1960	1961	1962
Lump [1] and Broken	(2)	0.1	------	(2)	------	0.2	0.1	0.1	(2)	(2)
Egg	1.1	.9	0.9	1.8	3.1	.6	.6	.5	0.6	0.9
Stove	11.9	11.4	11.5	11.6	10.7	13.5	12.3	11.8	12.0	12.2
Chestnut	16.2	15.1	15.4	15.9	12.5	17.0	15.5	15.3	15.8	15.4
Pea	11.6	11.4	11.1	11.2	10.8	10.0	10.0	10.1	10.3	10.7
Total Pea and larger	40.8	38.9	38.9	40.5	37.1	41.3	38.5	37.8	38.7	39.2
Buckwheat No. 1	12.1	11.6	10.8	12.3	11.0	12.9	12.8	12.1	11.7	12.4
Buckwheat No. 2 (Rice)	10.0	9.1	8.6	8.9	8.6	9.5	9.1	9.5	9.2	9.5
Buckwheat No. 3 (Barley)	10.1	9.0	9.0	10.2	8.8	13.8	12.7	13.2	12.0	11.1
Buckwheat No. 4	7.8	7.4	7.3	9.0	6.8	6.3	6.4	7.3	7.2	7.2
Buckwheat No. 5	10.5	10.4	10.9	11.1	10.6	7.2	10.6	11.6	10.8	12.7
Other [3]	8.7	13.6	14.5	8.0	17.1	9.0	9.9	8.5	10.4	7.9
Total Buckwheat No. 1 and smaller	59.2	61.1	61.1	59.5	62.9	58.7	61.5	62.2	61.3	60.8
	Wyoming region [4]					Total				
Lump [1] and Broken	0.1	0.1	0.1	0.1	(2)	0.1	0.1	0.1	0.1	(2)
Egg	.9	.8	.7	1.9	4.4	.8	.7	.6	1.2	2.5
Stove	17.9	17.0	14.7	15.3	15.8	14.9	13.8	12.8	13.0	13.2
Chestnut	22.3	20.8	19.8	20.2	17.7	18.8	17.3	16.9	17.3	15.6
Pea	15.0	14.8	14.0	14.5	13.8	12.1	11.9	11.6	11.8	11.8
Total Pea and larger	56.2	53.5	49.3	52.0	51.7	46.7	43.8	42.0	43.4	43.1
Buckwheat No. 1	14.9	15.4	16.0	15.1	15.1	13.5	13.5	13.3	12.9	13.1
Buckwheat No. 2 (Rice)	8.9	9.4	9.2	9.4	9.1	9.4	9.2	9.2	9.2	9.2
Buckwheat No. 3 (Barley)	10.3	11.3	10.9	11.3	10.5	11.9	11.6	11.8	11.5	10.5
Buckwheat No. 4	1.9	2.6	2.2	3.0	2.3	4.9	5.2	5.5	6.1	5.4
Buckwheat No. 5	1.3	2.3	3.3	4.3	4.8	5.6	7.7	8.6	8.7	9.5
Other [3]	6.5	5.5	9.1	4.9	6.5	8.0	9.0	9.6	8.2	9.2
Total Buckwheat No. 1 and smaller	43.8	46.5	50.7	48.0	48.3	53.3	56.2	58.0	56.6	56.9

[1] Quantity of Lump included is insignificant.
[2] Less than 0.05 percent.
[3] Includes various mixtures of Buckwheat Nos. 2 to 5 and coal of relatively low value.
[4] Includes Sullivan County.

TABLE 7.—Production of Pennsylvania anthracite in 1962, by regions

Region	Production							
	Rail shipments		Truck shipments		Colliery fuel		Total	
	Net tons	Value [1]	Net tons	Values [1]	Net tons	Value	Net tons	Value [1]
Lehigh: Preparation plants	1,345,870	$10,635,081	1,808,660	$12,970,327	16,491	$71,894	3,171,021	$23,677,302
Schuylkill:								
Preparation plants	3,124,879	23,711,748	4,186,225	32,448,225	13,525	62,556	7,324,629	56,222,529
Dredges	580,763	1,947,360	145,903	527,472	385	1,155	727,051	2,475,987
Total Schuylkill	3,705,642	25,659,108	4,332,128	32,975,697	13,910	63,711	8,051,680	58,698,516
Wyoming: Preparation plants [2]	2,881,210	27,606,896	2,668,522	23,776,716	121,213	334,444	5,670,945	51,718,056
Total:								
Preparation plants	7,351,959	61,953,725	8,663,407	69,195,268	151,229	468,894	16,166,595	131,615,878
Dredges	580,763	1,947,360	145,903	527,472	385	1,155	727,051	2,477,987
Grand total	7,932,722	63,901,085	8,809,310	69,722,740	151,614	470,049	16,893,646	134,093,874

[1] Value given for shipments is that at which coal left possession of producing company; does not include selling expenses.
[2] Includes Sullivan County.

TABLE 8.—Pennsylvania anthracite produced, 1958–62, by fields, in net tons

Field	1958	1959	1960	1961	1962
Eastern Middle: Breakers and washeries	1,738,555	1,915,788	2,121,500	2,002,163	2,257,038
Western Middle:					
Breakers and washeries	5,982,747	5,813,868	5,104,897	4,673,983	3,723,273
Dredges	68,986	65,683	71,828	58,287	41,105
Total	6,051,733	5,879,551	5,176,725	4,732,270	3,764,378
Southern:					
Breakers and washeries	5,086,583	5,269,930	4,530,628	4,486,037	4,515,339
Dredges	610,668	650,936	640,335	687,561	685,946
Total	5,697,251	5,920,866	5,170,963	5,173,598	5,201,285
Northern:					
Breakers and washeries [1]	7,671,464	6,933,081	6,348,253	5,538,408	5,670,945
Dredges	12,139				
Total	7,683,603	6,933,081	6,348,253	5,538,408	5,670,945
Total:					
Breakers and washeries	20,479,349	19,932,667	18,105,278	16,700,591	16,166,595
Dredges	691,793	716,619	712,163	745,848	727,051
Grand total	21,171,142	20,649,286	18,817,441	17,446,439	16,893,646

[1] Includes Sullivan County.

TABLE 9.—Production of Pennsylvania anthracite in 1962, by counties

County	Production							
	Rail shipments		Truck shipments		Colliery fuel		Total	
	Net tons	Value [1]	Net tons	Value [1]	Net tons	Value	Net tons	Value [1]
Berks, Lancaster, Lebanon, and Snyder	564, 762	$1, 876, 895	102, 188	$344, 966	7, 282	$13, 898	674, 232	$2, 235, 759
Carbon	287, 065	2, 312, 145	378, 233	3, 168, 863	8, 997	15, 336	674, 295	5, 496, 344
Columbia	230, 052	1, 332, 121	157, 887	1, 212, 661	385	2, 628	388, 324	2, 547, 410
Dauphin	55, 873	367, 244	86, 924	293, 647			142, 797	660, 891
Lackawanna	463, 651	4, 305, 189	630, 585	6, 165, 374	8, 417	61, 091	1, 102, 653	10, 531, 654
Luzerne	2, 863, 329	26, 457, 238	3, 077, 974	24, 194, 440	119, 749	325, 883	6, 061, 052	50, 977, 561
Northumberland	358, 190	2, 820, 721	1, 266, 129	9, 428, 536	695	3, 310	1, 625, 014	12, 252, 567
Schuylkill	3, 108, 623	24, 417, 678	3, 088, 251	24, 776, 671	6, 080	47, 813	6, 202, 954	49, 242, 162
Sullivan			11, 627	63, 032	9	90	11, 636	63, 122
Susquehanna and Wayne	1, 177	11, 854	9, 512	74, 550			10, 689	86, 404
Total	7, 932, 722	63, 901, 085	8, 809, 310	69, 722, 740	151, 614	470, 049	16, 893, 646	134, 093, 874

[1] Value given for shipments is that at which coal left possession of producing company; does not include selling expenses.

Underground mines.—In contrast to some recent years in which underground production declined steadily, deep-mined output of Pennsylvania anthracite was relatively the same as in 1961—dropping only about 100,000 tons below the figure for that year. This stability was undoubtedly attributable to the continued shipment of large-size coal (principally Egg and Stove) to U.S. armed forces in West Germany, firmer demand in the United States because of the abnormally cold weather, and the decline in production at strip pits. In the Wyoming region, which lost the lead to the Schuylkill region in 1961, output from underground mines decreased about 160,000 tons, and in the Lehigh region, about 33,000 tons. In the Schuylkill region, however, underground production increased about 82,000 tons. As a result, the Schuylkill region increased its share of total underground production from 52 percent in 1961 to 54 percent in 1962; the Wyoming's dropped from 45 to 44 percent; and, the Lehigh's from 3 to only 2 percent. Data on 1962 production by source, fields, and regions are presented in tables 10 and 11. Trends in production by source are shown graphically in figures 2 and 3.

TABLE 10.—Pennsylvania anthracite produced in 1962, classified as fresh mined, culm-bank, and river coal, by fields, in net tons

Field	Fresh mined coal				From culm banks	From river dredging	Total
	Underground mines			Strip pits			
	Mechanically loaded	Hand loaded	Total				
Eastern Middle	76, 052	22, 584	98, 636	1, 235, 880	922, 522		2, 257, 038
Western Middle	239, 680	1, 236, 927	1, 476, 607	1, 770, 883	475, 783	41, 105	3, 764, 378
Southern	411, 076	1, 781, 072	2, 192, 148	1, 797, 136	526, 055	685, 946	5, 201, 285
Northern [1]	2, 338, 556	566, 975	2, 905, 531	2, 018, 308	747, 106		5, 670, 945
Total	3, 065, 364	3, 607, 558	6, 672, 922	6, 822, 207	2, 671, 466	727, 051	16, 893, 646

[1] Includes Sullivan County.

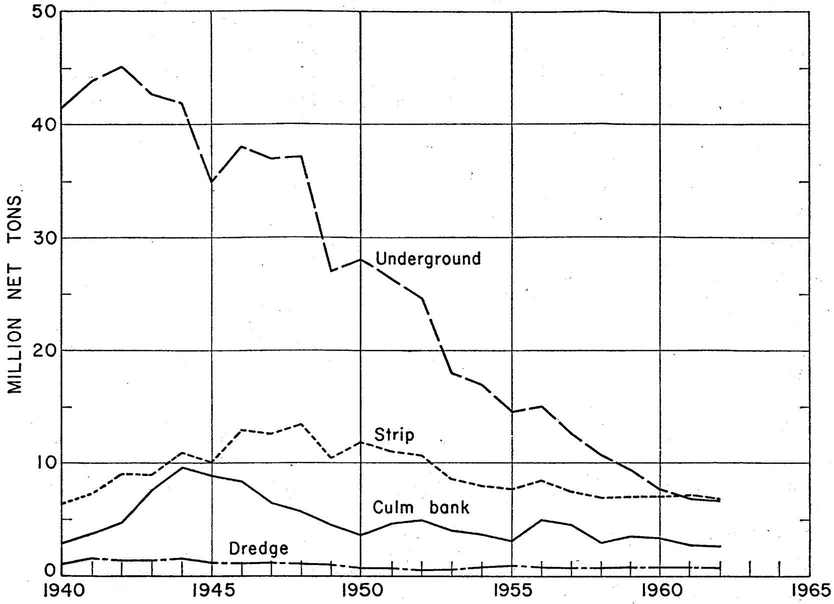


FIGURE 2.—Production of Pennsylvania anthracite, by sources, 1940–62.

TABLE 11.—Pennsylvania anthracite produced in 1962, classified as fresh mined, culm-bank, and river coal, by regions, in net tons

Region	Fresh mined coal				From culm banks	From river dredging	Total
	Underground mines			Strip pits			
	Mechanically loaded	Hand loaded	Total				
Lehigh	76,052	56,020	132,072	2,064,299	974,650	---------	3,171,021
Schuylkill	650,756	2,984,563	3,635,319	2,739,600	949,710	727,051	8,051,680
Wyoming [1]	2,338,556	566,975	2,905,531	2,018,308	747,106	---------	5,670,945
Total	3,065,364	3,607,558	6,672,922	6,822,207	2,671,466	727,051	16,893,646

[1] Includes Sullivan County.

Strip Pits.—Production at stripping operations declined 6 percent in 1962. In the Schuylkill region, strip output again fell sharply (18 percent, as compared with a decline of 11 percent between 1960 and 1961) but continued at about the 1961 level in the Lehigh. In the Wyoming region, however, strip-pit production increased 10 percent over 1961.

Although continuing to decline as a source of strip coal, the Schuylkill region again led in this type of production, contributing 40 percent of the year's total, as compared with 46 percent in 1961. Each of the other two regions produced 30 percent. With the virtual cessation of deep mining in the Lehigh region, 94 percent of its fresh-mined output (strip plus underground) in 1962 originated at strip pits and only 6 percent at underground operations. In the Wyoming the per-

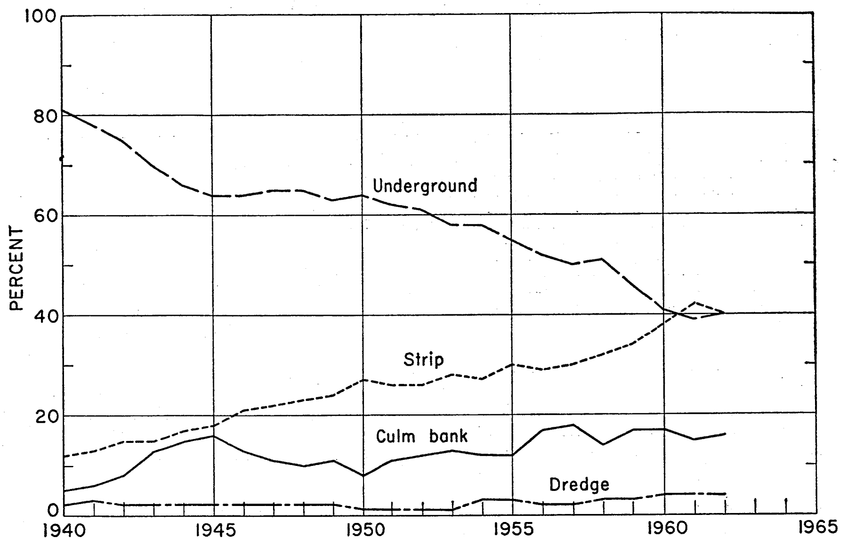


FIGURE 3.—Production of Pennsylvania anthracite, by sources, 1940–62, in percent of total.

centages were 41 percent strip and 59 percent underground, and in the Schuylkill, 43 and 57 percent, respectively. Table 12 presents detailed data on strip-pit production for certain years in the period 1915–62, and figure 4 shows regional production of strip coal for the 1940–62 period.

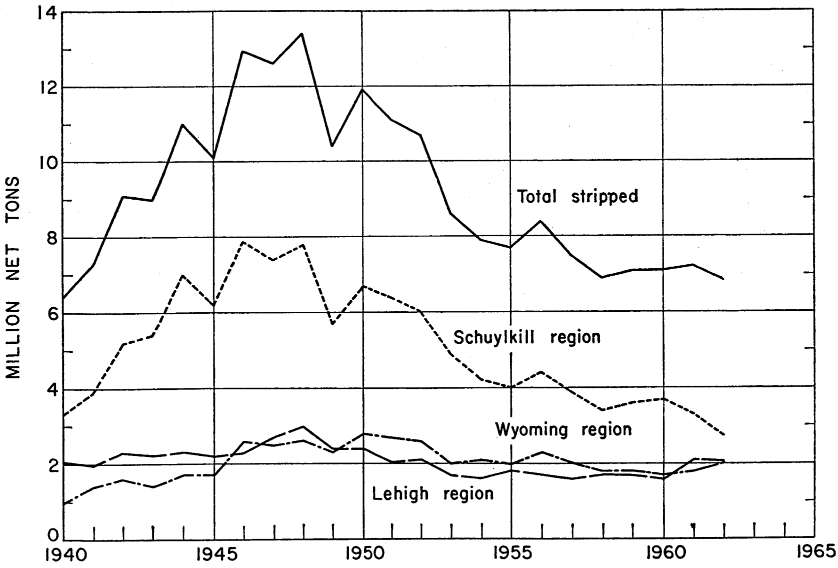


FIGURE 4.—Pennsylvania anthracite mined from strip pits, by regions, 1940–62.

TABLE 12.—Production of Pennsylvania anthracite from strip pits

	Mined by stripping (net tons)	Percent of fresh-mined total	Number of men employed	Average number of days worked
1915	1,121,603	(1)	(1)	(1)
1920	2,054,441	2.5	(1)	(1)
1925	1,578,478	2.7	(1)	(1)
1930	2,536,288	3.8	(1)	(1)
1955	7,703,907	34.7	[2] 4,642	[2] 205
1956	8,354,230	35.7	4,840	216
1957	7,543,157	37.4	4,546	207
1958	6,877,761	39.1	4,418	196
1959	7,096,343	43.0	3,775	200
1960	7,112,288	48.0	3,470	195
1961	7,246,646	51.6	3,194	207
1962:				
Lehigh region	2,064,299	94.0	937	222
Schuylkill region	2,739,600	43.0	1,286	185
Wyoming region [3]	2,018,308	41.0	785	219
Total	6,822,207	50.6	3,008	206

[1] Data not available.
[2] Estimated.
[3] Includes Sullivan County.

Culm Banks.—After a sharp decline in 1961 (19 percent), production from old culm and silt banks was relatively unchanged in 1962. However, because some large banks were depleted during the year and operations were shifted to other sites, the percentages contributed by the individual regions showed marked changes. For example, in 1961 the Schuylkill region accounted for 51 percent of total culm-bank production, but in 1962 for only 36 percent, a tonnage decline of 31 percent. As the result of the absolute gain over 1961 of 48 percent, the Lehigh region's share increased from 25 percent in 1961 to 36 percent; the Wyoming's share rose from 24 to 28 percent because of an 18-percent gain over 1961. Tables 10, 11, and 13 contain data on the production of bank coal.

Dredges.—Detailed data will be found in tables 14 and 15 on the recovery of small-sized anthracite from the rivers and streams draining the anthracite region. As indicated by these data, the decline from 1961 was limited to about 20,000 tons, or 3 percent, probably because a preponderant part of the annual dredge output was "captive" tonnage and was thus not entirely responsive to market fluctuations. Also, for the first time on record, no coal was produced from the Lehigh River or its tributaries.

Weekly and Monthly Data.—The Bureau of Mines publishes a series of weekly anthracite reports, which contain weekly and monthly estimates of production and daily and weekly carloading data. The estimates are based primarily upon carloading data supplied by the Association of American Railroads and monthly truck-shipment data released by the Pennsylvania Department of Mines and Mineral Industries. These data are supplemented by estimates on the consumption of colliery fuel and production of river coal, which are based upon the annual production canvass. The weekly and monthly estimates of production in 1962 have been adjusted to the canvass total and are presented in tables 16 and 17. The weekly reports also present monthly data on rail and truck shipments, stocks, imports and exports, consumption, and details on the Lake-dock trade and other related subjects. Copies of the reports may be obtained by writing to the Bureau of Mines, U.S. Department of the Interior, Washington, D.C., 20240.

TABLE 13.—Production of Pennsylvania anthracite from culm banks, by regions, in net tons

	Lehigh	Schuylkill	Wyoming	Sullivan County	Total
1935	192, 790	1, 748, 960	760, 718	-----	2, 702, 468
1936	136, 058	2, 532, 116	525, 798	-----	3, 193, 972
1937	101, 239	2, 178, 482	442, 878	-----	2, 722, 599
1938	53, 037	1, 941, 896	345, 511	-----	2, 340, 444
1939	64, 180	2, 159, 548	360, 086	-----	2, 583, 814
1940	192, 878	2, 109, 557	480, 603	-----	2, 783, 038
1941	326, 755	2, 881, 049	449, 062	-----	3, 656, 866
1942	745, 934	3, 529, 757	459, 373	-----	4, 735, 064
1943	1, 944, 047	4, 577, 917	1, 041, 841	19, 893	7, 583, 698
1944	2, 125, 317	5, 787, 036	1, 673, 994	13, 833	9, 600, 180
1945	2, 086, 864	4, 936, 907	1, 728, 440	34, 448	8, 786, 659
1946	1, 875, 590	4, 752, 141	1, 780, 874	22, 487	8, 431, 092
1947	1, 044, 501	3, 947, 016	1, 409, 217	2, 912	6, 403, 646
1948	796, 114	3, 729, 542	1, 098, 123	-----	5, 623, 779
1949	694, 763	2, 778, 131	956, 250	-----	4, 429, 144
1950	366, 069	2, 533, 535	565, 829	1, 877	3, 467, 310
1951	566, 613	3, 578, 795	484, 792	-----	4, 630, 200
1952	791, 445	3, 407, 974	566, 097	-----	4, 765, 516
1953	714, 646	2, 792, 323	504, 031	-----	4, 011, 000
1954	797, 761	2, 320, 006	447, 715	-----	3, 565, 482
1955	862, 539	1, 934, 492	416, 015	-----	3, 213, 046
1956	1, 493, 381	2, 750, 838	530, 580	-----	4, 774, 799
1957	1, 457, 869	2, 479, 241	584, 300	-----	4, 521, 410
1958	605, 741	1, 742, 356	550, 756	3, 900	2, 902, 753
1959	831, 254	1, 905, 465	[1] 684, 135	(1)	3, 420, 854
1960	825, 825	1, 563, 746	907, 441	-----	3, 297, 012
1961	656, 528	1, 377, 204	635, 627	-----	2, 669, 359
1962	974, 650	949, 710	747, 106	-----	2, 671, 466

[1] Sullivan County included in Wyoming region.

TABLE 14.—Pennsylvania anthracite produced by dredges in 1962, by rivers (including tributaries)

River	Production (net tons)	Value	
		Total	Average
Schuylkill	98, 076	$324, 234	$3. 31
Susquehanna	628, 975	2, 151, 753	3. 42
Total	727, 051	2, 475, 987	3. 41

TABLE 15.—Pennsylvania anthracite produced by dredges, by rivers (including tributaries)

	Lehigh River (net tons)	Schuylkill River (net tons)	Susquehanna River (net tons)	Total (net tons)	Total value	Average value (per ton)
1940	[1] 78,947	(1)	863,997	942,944	$1,097,000	$1.16
1941	47,838	396,522	1,073,203	1,517,563	1,839,784	1.21
1942	9,385	268,919	1,006,729	1,285,033	1,478,719	1.15
1943	37,452	342,815	954,470	1,334,737	1,972,777	1.48
1944	40,894	494,371	837,472	1,372,737	2,084,431	1.52
1945	41,409	366,161	797,656	1,205,226	1,924,148	1.60
1946	37,441	247,757	847,196	1,132,394	2,091,324	1.85
1947	46,478	158,102	1,015,126	1,219,706	2,480,068	2.03
1948	54,284	67,871	865,849	988,004	2,291,752	2.32
1949	22,131	52,012	790,979	865,122	2,131,096	2.46
1950	21,877	34,222	563,465	619,564	1,677,508	2.71
1951	25,344	27,454	508,770	561,568	1,576,576	2.81
1952	17,402	30,407	324,245	372,054	1,109,778	2.98
1953	31,391	20,643	386,147	438,181	1,449,149	3.31
1954	16,015	-----------	709,892	725,907	1,810,026	2.49
1955	29,935	60,256	698,652	788,843	1,844,835	2.34
1956	44,262	5,540	666,485	716,287	1,273,415	1.78
1957	30,650	10,167	616,884	657,701	1,143,152	1.74
1958	30,763	10,230	650,800	691,793	1,324,943	1.92
1959	13,312	13,213	690,094	716,619	2,310,895	3.22
1960	22,700	23,624	665,839	712,163	2,257,367	3.17
1961	2,975	122,880	619,993	745,848	2,355,314	3.16
1962	-----------	98,076	628,975	727,051	2,475,987	3.41

[1] Schuylkill included with Lehigh in 1940.

TABLE 16.—Estimated weekly production of Pennsylvania anthracite in 1962 [1]

Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons	Week ended—	Thousand net tons
Jan. 6	320	Apr. 14	298	July 21	290	Oct. 27	351
13	408	21	318	28	298	Nov. 3	314
20	412	28	294	Aug. 4	306	10	391
27	436	May 5	311	11	316	17	409
Feb. 3	378	12	263	18	283	24	329
10	421	19	301	25	268	Dec. 1	415
17	335	26	313	Sept. 1	281	8	406
24	390	June 2	264	8	271	15	371
Mar. 3	369	9	304	15	294	22	403
10	384	16	305	22	313	29	272
17	361	23	327	29	310	31 [2]	48
24	331	30	333	Oct. 6	345		
31	300	July 7	112	13	310	Total	16,894
Apr. 7	284	14	85	20	343		

[1] Estimated from weekly carloadings as reported by the Association of American Railroads and other factors; adjusted to annual production from Bureau of Mines canvass.

[2] Figures represent output of working days in that part of week included in calendar year 1962.

Mechanical Loading.—Of total underground production in 1962, about 3.1 million tons was loaded mechanically, a decline of approximately 312,000 tons, or 9 percent. As the tonnage loaded by hand rose 200,000 tons, or 6 percent over 1961, the relatively smaller decline reported for total underground production indicated that much of the decline in underground output occurred at comparatively large operations equipped with mechanical loading devices. The significance of this development is also heightened by the fact that hand loading, which accounted for 47 percent of the total in 1960, reached 54 percent of total underground production in 1962.

TABLE 17.—Estimated monthly production of Pennsylvania anthracite, in thousand net tons [1]

Month	1955	1956	1957	1958	1959	1960	1961	1962
January	2, 454	2, 743	2, 625	2, 161	2, 318	1, 701	1, 767	1, 810
February	2, 568	2, 360	2, 072	1, 753	1, 645	1, 643	1, 721	1, 522
March	2, 007	2, 052	1, 798	1, 476	1, 593	1, 749	1, 438	1, 513
April	1, 723	2, 258	2, 037	1, 545	1, 588	1, 281	1, 173	1, 257
May	1, 985	1, 947	2, 294	1, 612	1, 466	1, 313	1, 418	1, 319
June	2, 130	2, 470	2, 551	1, 963	1, 777	1, 496	1, 344	1, 339
July	1, 845	1, 890	1, 478	1, 377	1, 206	1, 186	1, 178	906
August	1, 904	2, 729	2, 294	1, 750	1, 600	1, 704	1, 533	1, 328
September	2, 453	2, 509	2, 173	2, 050	1, 823	1, 580	1, 394	1, 193
October	2, 244	2, 971	2, 262	1, 966	1, 805	1, 678	1, 603	1, 528
November	2, 385	2, 629	1, 928	1, 559	1, 863	1, 692	1, 501	1, 664
December	2, 507	2, 342	1, 826	1, 959	1, 965	1, 794	1, 376	1, 515
Total	26, 205	28, 900	25, 338	21, 171	20, 649	18, 817	17, 446	16, 894

[1] Production is estimated from weekly carloadings as reported by the Association of American Railroads and includes mine fuel, coal sold locally, and dredge coal.

In the Northern field, where mechanical loading is centered because of the relatively flat-lying seams, the total loaded mechanically dropped by about 293,000 tons, or 11 percent. There were also decreases of 28 and 10 percent, respectively, in the Eastern Middle and Western Middle fields but an increase of 9 percent in the Southern field. Statistics on tonnages loaded and the number and types of equipment used are presented in tables 18 and 19. Figure 5 shows trends in mechanical loading, hand loading, and stripping since 1940.

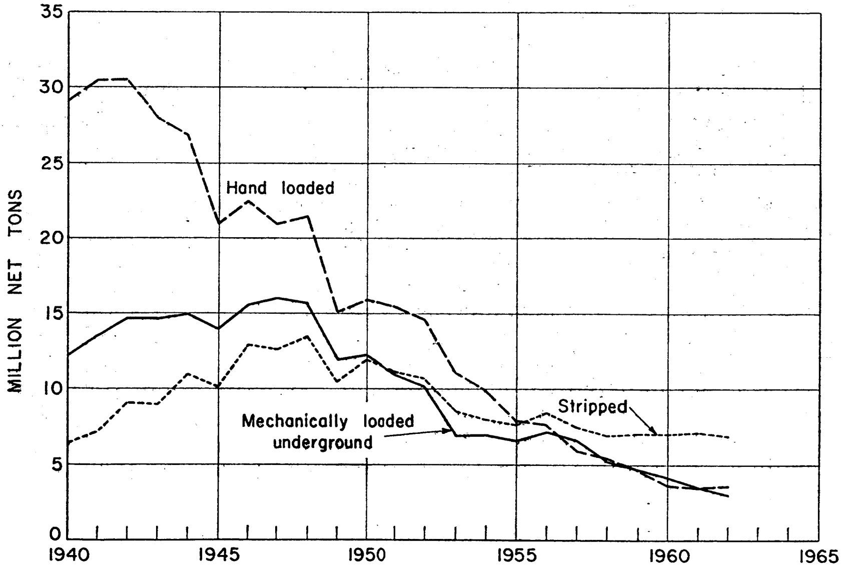


FIGURE 5.—Pennsylvania anthracite mechanically loaded, hand loaded, and stripped, 1940–62.

TABLE 18.—Pennsylvania anthracite loaded mechanically underground, by fields, in net tons

Field	Scraper loaders [1]		Pit-car loaders		Hand-loaded face conveyors, all types [2]		Total mechanically loaded	
	1961	1962	1961	1962	1961	1962	1961	1962
Northern	810,284	678,681	--------	--------	1,821,520	1,659,875	2,631,804	2,338,556
Eastern Middle	2,515	8,561	1,200	1,335	101,486	66,156	105,201	76,052
Western Middle	92,823	64,647	--------	--------	172,356	175,033	265,179	239,680
Southern	77,367	85,611	9,600	18,723	288,627	306,742	375,594	411,076
Total	982,989	837,500	10,800	20,058	2,383,989	2,207,806	3,377,778	3,065,364

[1] Includes mobile loaders.
[2] Shaker chutes, including those equipped with duckbills.

TABLE 19.—Pennsylvania anthracite loaded mechanically underground, in net tons

	Scraper loaders		Mobile loaders		Conveyors [1] and pit-car loaders		Total loaded mechanically	
	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded	Number of units	Net tons loaded
1958	290	931,313	51	658,549	1,234	3,742,181	1,575	5,332,043
1959	186	771,142	46	692,631	869	3,236,769	1,101	4,700,542
1960	114	525,482	45	691,942	754	2,826,968	913	4,044,392
1961	132	595,572	27	387,417	616	2,394,789	775	3,377,778
1962	128	541,241	34	296,259	536	2,227,864	698	3,065,364

[1] Includes duckbills and other self-loading conveyors.

Cutting machines.—Only five coal-cutting machines were reported used by the Pennsylvania anthracite industry in 1962. Although there were two fewer machines than in 1961, the tonnage undercut prior to shooting increased from 236,000 tons in 1961 to 278,000 tons, all of which was mined in the Wyoming region.

Power Equipment.—As production from strip pits declined substantially in 1962, the total number of power units reported used at this type of operation also decreased. The number of power shovels in use at pits during the year totaled 114, a decline of 28 from 1961, but the number of draglines increased from 197 to 211 over the same time. The decline in the number of power units was even more severe in bank operations, where only 23 shovels and 24 draglines were used, as compared with 30 shovels and 46 draglines in 1961. Of the equipment reported, 6 shovels and 13 draglines were used for both stripping and bank recovery. Information on the number and types of equipment employed by the anthracite industry in 1960–62 is given in table 21.

TABLE 20.—Trends in mechanical loading, hand loading, and stripping of Pennsylvania anthracite

(Mechanical loading includes coal handled on pit-car loaders and hand-loaded face conveyors)

Year	Fresh mined coal							
	Underground					Strip pits		Total
	Mechanical loading (net tons)	Percent of total underground	Hand loading (net tons)	Percent of total underground	Total (net tons)	Net tons	Percent of total fresh mined	
1927	[1] 2,223,281	3.0	71,434,537	97.0	73,657,818	2,153,156	2.8	75,810,974
1928	[1] 2,351,074	3.4	67,373,788	96.6	69,724,862	2,422,924	3.4	72,147,786
1929	3,470,158	5.0	66,493,690	95.0	69,963,848	1,911,766	2.7	71,875,614
1930	4,467,750	6.9	60,458,344	93.1	64,926,094	2,536,288	3.8	67,462,382
1931	4,384,780	8.2	49,074,722	91.8	53,459,502	3,813,237	6.7	57,272,739
1932	5,433,340	12.4	38,400,820	87.6	43,834,160	3,980,973	8.3	47,815,133
1933	6,557,267	16.0	34,474,844	84.0	41,032,111	4,932,069	10.7	45,964,180
1934	9,284,486	19.1	39,290,255	80.9	48,574,741	5,798,138	10.7	54,372,879
1935	9,279,057	21.2	34,503,819	78.8	43,782,876	5,187,072	10.6	48,969,948
1936	10,827,946	24.2	33,898,560	75.8	44,726,506	6,203,267	12.2	50,929,773
1937	10,683,837	25.1	31,882,514	74.9	42,566,351	5,696,018	11.8	48,262,369
1938	10,151,669	26.6	27,990,628	73.4	38,142,297	5,095,341	11.8	43,237,638
1939	11,773,833	27.7	30,797,715	72.3	42,571,548	5,486,479	11.4	48,058,027
1940	12,326,000	29.7	29,190,837	70.3	41,516,837	6,352,700	13.3	47,869,537
1941	13,441,987	30.6	30,435,277	69.4	43,877,264	7,316,574	14.3	51,193,838
1942	14,741,459	32.6	30,495,240	67.4	45,236,699	9,070,933	16.7	54,307,632
1943	14,745,793	34.5	27,990,005	65.5	42,735,798	8,989,387	17.4	51,725,185
1944	14,975,146	35.8	26,800,270	64.2	41,775,416	10,953,030	20.8	52,728,446
1945	13,927,955	39.9	20,957,744	60.1	34,885,699	10,056,325	22.4	44,942,024
1946	15,619,162	41.0	22,465,295	59.0	38,084,457	12,858,930	25.2	50,943,387
1947	16,054,011	43.4	20,909,101	56.6	36,963,112	12,603,545	25.4	49,566,657
1948	15,742,368	42.3	21,432,923	57.7	37,175,291	13,352,874	26.4	50,528,165
1949	11,858,088	43.9	15,172,562	56.1	27,030,650	10,376,808	27.7	37,407,458
1950	12,335,650	43.8	15,820,245	56.2	28,155,895	11,833,934	29.6	39,989,829
1951	10,847,787	41.2	15,494,452	58.8	26,342,239	11,135,990	29.7	37,478,229
1952	10,034,464	40.5	14,713,819	59.5	24,748,283	10,696,705	30.2	35,444,988
1953	6,838,769	38.2	11,054,720	61.8	17,893,489	8,606,482	32.5	26,499,971
1954	6,978,035	41.4	9,874,373	58.6	16,852,408	7,939,680	32.0	24,792,088
1955	6,660,939	45.9	7,837,819	54.1	14,498,758	7,703,907	34.7	22,202,665
1956	7,308,110	48.5	7,746,794	51.5	15,054,904	8,354,230	35.7	23,409,134
1957	6,657,479	52.8	5,958,574	47.2	12,616,053	7,543,157	37.4	20,159,210
1958	5,332,043	49.8	5,366,792	50.2	10,698,835	6,877,761	39.1	17,576,596
1959	4,700,542	49.9	4,714,928	50.1	9,415,470	7,096,343	43.0	16,511,813
1960	4,044,392	52.6	3,651,586	47.4	7,695,978	7,112,288	48.0	14,808,266
1961	3,377,778	49.8	3,406,808	50.2	6,784,586	7,246,646	51.6	14,031,232
1962	3,065,364	45.9	3,607,558	54.1	6,672,922	6,822,207	50.6	13,495,129

---

[1] As reported by Commonwealth of Pennsylvania, Department of Mines.

TABLE 21.—Power shovels and draglines used in recovering coal from culm banks and in stripping Pennsylvania anthracite, by type of power

Type of power	1960			1961			1962		
	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total	Number of power shovels	Number of draglines	Total
Gasoline	23	11	34	22	15	37	8	6	14
Electric	43	51	94	41	56	97	39	59	98
Diesel	104	160	264	103	158	261	91	177	268
Diesel-Electric	----------	----------	--------	2	2	4	5	6	11
Total	170	222	392	168	231	399	143	248	391

PRICES AND VALUE OF SALES

On the basis of total production, including colliery fuel, the average value of Pennsylvania anthracite in 1962 was $7.94 per short ton, a decline of 1 percent from the $8.04 recorded in 1961. Total value of the year's output dropped to $134,094,000, or a decline of 4 percent. Prices of the larger sizes were slightly steadier during the year than those of the smaller coals, as shipments of the Pea and larger size group, which declined 5 percent, dropped only 4 percent in total value, while shipments of the Buckwheat No. 1 and smaller size category were down 3 percent but declined 6 percent in value.

Among the individual sizes, Lump and Broken which are usually produced in limited quantities on special order, and Pea were the only large sizes to drop in average value per ton, the former $0.11 below the $11.29 reported in 1961 and the latter, $0.02 less than the 1961 figure of $9.65. The industry reported average increases of $0.29 for Egg (average value in 1961, $10.84 per ton), $0.19 for Stove ($11.10 in 1961), and $0.13 for Chestnut ($11.36 in 1961). As a result, the average per-ton value for the Pea and larger size category increased to $10.90, a gain of $0.10 per ton. On the other hand, the average for the Buckwheat No. 1 and smaller group of sizes decreased $0.18 per ton (from $6.32 in 1961 to $6.14 in 1962), as the value for each size in the group fell below its 1961 level. The largest decline ($0.19) was for Buckwheat No. 3 (Barley), followed by Buckwheat No. 1 ($0.16), Buckwheat No. 2 (Rice) ($0.08), No. 4 ($0.07), and No. 5 and Other ($0.02). All of the foregoing values exclude dredge coal.

Wholesale prices quoted in the December 8, 1962, issue of Saward's Journal, which continued in effect until the end of the year, also reflected generally higher prices for the larger sizes and somewhat lower quotations on the small coals. The highest quotation per ton for Egg, Stove, and Chestnut sizes of $14.50 was the same as in the latter part of 1961; however, the lowest quotation on these sizes ($13.75) represented an increase of $0.50 per ton over the previous year. Although the lowest quotation on Pea coal ($10.50) was $0.05 higher than in 1961, the highest on this size ($11.50) was $0.25 lower than the year before. The lowest prices quoted on Buckwheat Nos. 1 and 2 (Rice) were the same in both years, $9.25 per ton; however, the high offers in December 1962 of $10.50 for Buckwheat No. 1 and $10.25 for No. 2 were $0.25 below 1961. Buckwheat No. 3 (Barley) quotations were unchanged at $8.15–$8.75. Quotations on Buckwheat No. 4 and smaller sizes are not available since prices of these sizes are usually negotiated privately by the buyer and seller.

Monthly retail prices of selected fuels are shown for several large cities in table 22. Average values, f.o.b. preparation plants, are presented by regions in table 23 to 25. Figure 6 illustrates trends in shipments and value, by size groups.

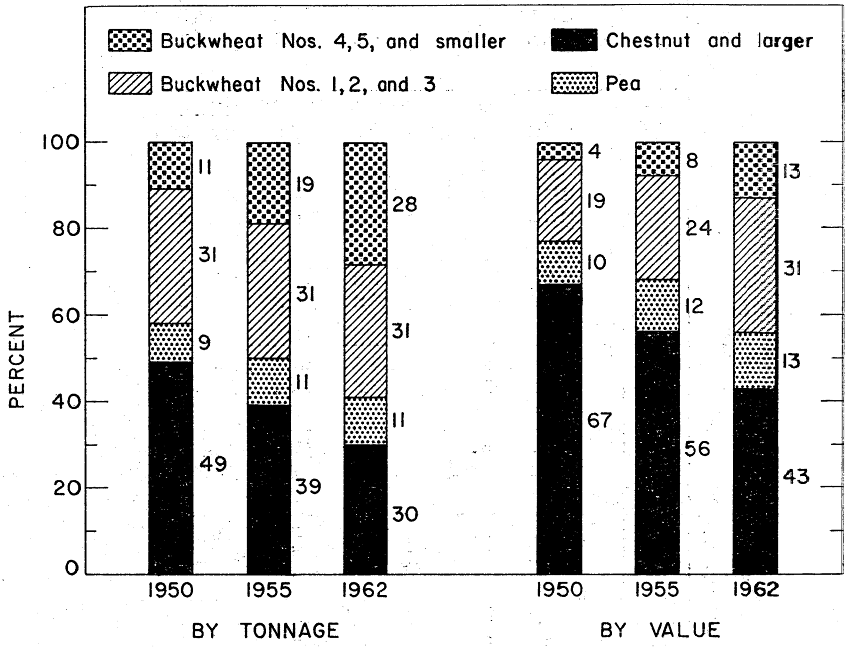


FIGURE 6.—Shipments of Pennsylvania anthracite, 1950, 1955, and 1962, by size groups, in percent of total tonnage and total value.

TABLE 22.—Retail prices of selected fuels in 1962, by months, for various cities[1]

(Coal and coke per net ton; heating oil, per 100 gallons; gas, per 100 therms)

City and fuel	January	February	March	April	May	June	July	August	September	October	November	December
Baltimore, Md.:												
Anthracite:												
Stove	$22.08	$22.08	$22.08	$22.08	$21.37	$21.37	$21.37	$21.37	$21.37	$21.37	$21.72	$22.08
Buckwheat No. 1	20.00	22.00	20.00	20.00	19.48	19.48	19.31	19.31	19.31	19.31	19.66	19.83
Heating oil: Fuel oil No. 2	15.86	15.86	15.60	15.04	14.87	14.87	14.87	14.87	14.87	14.87	15.00	15.59
Boston, Mass.:												
Anthracite:												
Stove	31.50	31.50	31.50	31.50	31.11	30.48	30.48	30.98	30.98	31.25	31.25	31.25
Buckwheat No. 1	25.50	25.50	25.50	25.50	25.56	25.19	25.19	25.38	25.38	25.38	25.38	25.38
Heating oil: Fuel oil No. 2	16.20	16.20	15.90	15.57	15.23	14.73	14.73	14.73	14.73	14.73	15.90	15.90
New York, N.Y.:												
Anthracite:												
Stove	28.21	28.21	28.21	28.21	26.73	26.64	27.28	27.28	27.28	28.27	28.27	28.35
Pea	24.13	24.13	24.13	24.13	22.31	22.31	22.66	22.66	22.66	23.71	23.71	23.81
Buckwheat No. 1	22.36	22.36	22.36	22.36	20.72	20.72	20.83	20.83	20.83	22.04	22.04	22.14
Heating oil: Fuel oil No. 2	16.05	16.05	15.93	15.19	14.98	14.98	14.98	14.98	14.98	14.98	15.56	15.99
Philadelphia, Pa.:												
Anthracite:												
Chestnut	25.78	25.78	25.78	25.78	22.78	22.78	22.78	22.78	22.78	23.45	23.45	25.78
Buckwheat No. 1	20.78	20.78	20.78	20.78	20.12	20.12	20.12	19.78	19.78	20.12	20.12	22.12
Heating oil: Fuel oil No. 2	15.81	15.81	15.50	14.90	14.72	14.59	14.46	14.46	14.59	14.59	15.31	15.70
Washington, D.C.:												
Anthracite:												
Chestnut	28.02	28.02	28.02	28.24	24.73	25.65	26.27	26.73	27.70	28.21	28.21	28.21
Buckwheat No. 1	21.44	21.64	21.64	21.81	20.30	20.65	20.96	21.11	21.45	21.66	21.66	21.66
Heating oil: Fuel oil No. 2	15.95	15.95	15.65	15.36	14.95	14.95	14.95	14.95	14.95	14.95	15.56	15.98
Gas, Natural	13.16	13.12	13.17	13.27	13.68	13.60	13.50	13.96	13.96	13.39	13.39	13.44

---

[1] Compiled from reports of Bureau of Labor Statistics. Prices are as of the 15th of the month. Data are preliminary. Sales tax included where applicable.

TABLE 23.—Average sales realization per net ton of Pennsylvania anthracite at preparation plants, in 1962, by regions and sizes

(Excludes dredge coal)

Size	Lehigh region			Schuylkill region		
	Shipped by rail	Shipped by truck	Total	Shipped by rail	Shipped by truck	Total
Lump[1] and Broken	--------	--------	--------	$11.57	$11.29	$11.34
Egg	$11.02	$11.05	$11.02	11.03	10.77	11.01
Stove	11.34	11.78	11.46	10.98	10.88	10.93
Chestnut	11.47	11.92	11.77	11.12	10.89	10.97
Pea	8.85	9.55	9.36	8.75	8.82	8.80
Total Pea and larger	10.91	10.93	10.92	10.45	10.30	10.36
Buckwheat No. 1	7.50	8.31	8.03	8.10	8.08	8.09
Buckwheat No. 2 (Rice)	7.68	9.17	8.80	7.92	8.03	7.99
Buckwheat No. 3 (Barley)	6.72	6.66	6.68	6.75	6.40	6.54
Buckwheat No. 4	4.86	5.17	4.94	4.55	4.63	4.58
Buckwheat No. 5	4.96	4.69	4.94	4.28	3.93	4.16
Other[2]	3.40	1.95	2.02	4.11	3.26	3.45
Total Buckwheat No. 1 and smaller	5.71	5.29	5.45	5.92	5.98	5.95
Total all sizes	7.90	7.17	7.48	7.59	7.75	7.68

	Wyoming region[3]			Total		
Lump[1] and Broken	$11.06	$11.06	$11.06	$11.14	$11.21	$11.18
Egg	11.21	11.12	11.21	11.14	11.01	11.13
Stove	11.55	11.72	11.59	11.34	11.19	11.29
Chestnut	11.86	12.11	11.98	11.54	11.46	11.49
Pea	10.15	10.80	10.60	9.29	9.80	9.63
Total Pea and larger	11.40	11.45	11.42	11.00	10.80	10.90
Buckwheat No. 1	8.36	9.21	8.86	8.12	8.57	8.39
Buckwheat No. 2 (Rice)	8.80	9.04	8.95	8.22	8.60	8.47
Buckwheat No. 3 (Barley)	6.74	6.82	6.77	6.74	6.56	6.64
Buckwheat No. 4	5.44	4.84	5.30	4.80	4.74	4.78
Buckwheat No. 5	4.65	4.53	4.61	4.54	4.07	4.41
Other[2]	1.90	2.23	2.22	3.80	2.47	2.62
Total Buckwheat No. 1 and smaller	7.03	6.87	6.94	6.21	6.08	6.14
Total all sizes	9.58	8.91	9.26	8.43	7.99	8.19

[1] Quantity of Lump included is insignificant.
[2] Includes various mixtures of Buckwheat Nos. 2 to 5 and coal of relatively low dollar value.
[3] Includes Sullivan County.

TABLE 24.—Average sales realization per net ton of Pennsylvania anthracite at preparation plants, by region and sizes

(Excludes dredge coal)

Size	Lehigh region					Schuylkill region				
	1958	1959	1960	1961	1962	1958	1959	1960	1961	1962
Lump[1] and Broken	$11.99	$12.88	-------	$11.29	-------	$13.74	$12.24	$10.62	$10.96	$11.34
Egg	12.02	12.06	$10.23	10.79	$11.02	12.11	11.26	10.23	10.39	11.01
Stove	12.85	11.89	10.59	11.14	11.46	11.83	11.06	10.39	10.69	10.93
Chestnut	13.18	12.11	10.98	11.52	11.77	11.86	11.11	10.56	10.80	10.97
Pea	10.60	10.07	9.44	9.22	9.36	9.69	9.14	8.59	8.66	8.80
Total Pea and larger	12.32	11.44	10.41	10.75	10.92	11.34	10.59	9.97	10.19	10.36
Buckwheat No. 1	9.56	9.22	8.75	8.24	8.03	8.77	8.60	8.14	7.99	8.09
Buckwheat No. 2 (Rice)	9.35	9.56	9.29	8.99	8.80	8.41	8.39	7.99	7.94	7.99
Buckwheat No. 3 (Barley)	6.95	7.55	7.25	6.89	6.68	6.54	6.84	6.76	6.62	6.54
Buckwheat No. 4	5.01	5.11	5.05	4.88	4.94	4.76	4.80	4.88	4.76	4.58
Buckwheat No. 5	4.74	4.96	4.89	4.70	4.94	4.32	4.37	4.23	4.21	4.16
Other[2]	2.52	2.31	1.77	1.86	2.02	3.34	2.75	2.90	2.99	3.45
Total Buckwheat No. 1 and smaller	6.59	6.27	5.82	6.10	5.45	6.38	6.14	6.00	5.82	5.95
Total all sizes	8.93	8.28	7.60	7.98	7.48	8.43	7.85	7.50	7.51	7.68
	Wyoming region[3]					Total				
Lump[1] and Broken	$12.40	$11.84	$11.20	$11.50	$11.06	$13.35	$12.25	$10.87	$11.29	$11.18
Egg	11.91	11.22	10.42	11.08	11.21	12.00	11.44	10.31	10.84	11.13
Stove	12.22	11.32	10.74	11.57	11.59	12.14	11.29	10.56	11.10	11.29
Chestnut	12.55	11.75	11.23	11.96	11.98	12.36	11.53	10.89	11.36	11.49
Pea	11.08	10.85	10.64	10.87	10.60	10.48	10.03	9.57	9.65	9.63
Total Pea and larger	12.04	11.36	10.90	11.51	11.42	11.80	11.04	10.42	10.80	10.90
Buckwheat No. 1	9.78	9.48	8.92	9.34	8.86	9.30	9.04	8.54	8.55	8.39
Buckwheat No. 2 (Rice)	8.99	9.27	9.09	9.24	8.95	8.78	8.90	8.56	8.55	8.47
Buckwheat No. 3 (Barley)	6.79	7.15	7.16	7.15	6.77	6.68	7.04	6.95	6.83	6.64
Buckwheat No. 4	5.02	5.20	5.19	5.15	5.30	4.86	4.95	4.95	4.85	4.78
Buckwheat No. 5	4.04	4.70	4.78	4.90	4.61	4.43	4.54	4.43	4.43	4.41
Other[2]	3.66	3.53	2.54	2.18	2.22	3.29	2.80	2.52	2.64	2.62
Total Buckwheat No. 1 and smaller	7.63	7.69	7.00	7.41	6.94	6.80	6.60	6.27	6.32	6.14
Total all sizes	10.11	9.65	8.92	9.54	9.26	9.14	8.55	8.01	8.26	8.19

[1] Quantity of Lump included is insignificant

[2] Includes various mixtures of Buckwheat Nos. 2 to 5 and coal of relatively low dollar value.

[3] Includes Sullivan County.

TABLE 25.—Average value per net ton of Pennsylvania anthracite from all sources, by regions[1]

Region	1961				1962			
	Shipped by rail	Shipped by truck	Colliery fuel	Total	Shipped by rail	Shipped by truck	Colliery fuel	Total
Lehigh	$7.98	$8.08	$7.58	$7.98	$7.90	$7.17	$4.36	$7.47
Schuylkill	7.15	7.77	7.43	7.15	6.92	7.61	4.58	7.29
Wyoming[2]	9.54	9.54	7.09	9.53	9.58	8.91	2.76	9.12
Total	7.68	8.38	7.23	8.04	8.06	7.91	3.10	7.94

[1] Value given for shipments is that at which coal left possession of producing company and does not include selling expenses.

[2] Includes Sullivan County.

EMPLOYMENT

Employment continued to decline in the anthracite industry in 1962. Based on reports submitted to the Bureau of Mines, the average number of men working daily was 14,010—11 percent less than in 1961.

Regionally, the labor force was distributed as in 1961: 50 percent in the Schuylkill region, 37 percent in the Wyoming, and 13 percent in the Lehigh. However, the decline in employment varied markedly from region to region, as the average number of men working daily decreased 14 percent in the Wyoming region, 10 percent in the Schuylkill, and 8 percent in the Lehigh.

Although the combined labor forces of Schuylkill, Luzerne, Northumberland, and Lackawanna Counties again accounted for 93 percent of the total, each of these major producing counties suffered employment losses in anthracite mining. However, because of shifts in the sources of production (underground, strip pits, and culm banks) and differences in the rate of mine closures, declines in county employment were uncorrelative with production. For example, in Lackawanna County the 1962 labor force was 31 percent less than in 1961, but production declined only 7 percent. In Northumberland County, employment was 17 percent below the 1961 total, and production, 15 percent less. In Luzerne employment was down 6 percent, while production rose 8 percent. In Schuylkill County, employment was 7 percent and production 10 percent lower.

Of the total number of men working daily in 1962, 41 percent were employed at underground mines, 22 percent at strip pits, 17 percent at preparation plants, 15 percent in surface work at underground mines (including general shops), 4 percent at culm banks, and 1 percent on dredges. Despite only a small decrease in underground production, the average number of men working at deep mines (underground plus surface workers) dropped to 7,870, a decrease of 13 percent, as a result of the industry's continuing effort to concentrate production at the most efficient mines.

Pennsylvania anthracite operations were active an average of 204 days in 1962, a gain of 8 days over 1961. The labor force in the Wyoming region averaged 214 days of work, in the Lehigh 200 days, and in the Schuylkill 197 days. However, because of the 11 percent decrease in the number employed, total man-days worked declined to 2,853,000, or 8 percent. The productivity rate in the anthracite industry again advanced to a record high, 5.92 tons per man-day, as it eclipsed the former record of 5.63 tons in 1961.

Data on the number of men employed, days worked, man-days of labor, and productivity rates are shown, by region and type of operation, in table 26. A breakdown of the labor force by counties is presented in table 27.

DISTRIBUTION

According to reports submitted voluntarily to the Bureau of Mines by producers, wholesalers, and dock operators, 15,843,000 tons of Pennsylvania anthracite was moved to market during the 1961–62 coal year (April 1–March 31), a decline of approximately 5 percent

TABLE 26.—Men employed, days worked, man-days of labor and output per man per day at operations producing Pennsylvania anthracite in 1962

(Includes operations of strip contractors)

	Lehigh region	Schuylkill region	Wyoming region[1]	Total	
				1962	1961
Average number of men working daily:					
Underground	152	3,123	2,504	5,779	6,664
In strip pits	937	1,286	785	3,008	3,194
At culm banks	183	214	166	563	627
At preparation plants	465	1,298	680	2,443	2,730
Other surface	111	1,010	970	2,091	2,416
Total excluding dredge operations	1,848	6,931	5,105	13,884	15,631
Dredge operations		126		126	161
Total	1,848	7,057	5,105	14.010	15,792
Average number of days active:					
All operations except dredges	200	196	214	203	196
Dredge operations		227		227	189
Average, all operations	200	197	214	204	196
Man-days of labor:					
All operations except dredges	370,341	1,361,293	1,092,606	2,824,240	3,067,185
Dredge operations		28,613		28,613	30,452
Total, all operations	370,341	1,389,906	1,092,606	2,852,853	3,097,637
Average tons per man-day:					
All operations except dredges	8.56	5.38	5.19	5.72	5.44
Dredge operations		25.41		25.41	24.49
Average, all operations	8.56	5.79	5.19	5.92	5.63

[1] Includes Sullivan County.

TABLE 27.—Men employed at operations producing Pennsylvania anthracite, by counties

(Includes operations of strip contractors)

County	1961	1962	County	1961	1962
Berks, Lancaster, Lebanon, Northampton, and Snyder[1]	118	101	Northumberland	2,261	1,870
Carbon	324	306	Schuylkill	5,553	5,142
Columbia	436	389	Sullivan	13	19
Dauphin	189	186	Susquehanna and Wayne	5	7
Lackawanna	1,906	1,312	Total	15,792	14,010
Luzerne	4.987	4,678			

[1] None employed in Northampton in 1962.

from the preceding year. About 90 percent of this tonnage was shipped to destinations in the United States, 5 percent to Canada, and the remaining 5 percent to other countries. Shipments during the year, when compared with those made in the 1960–61 coal year, were down 7 percent in the United States and 24 percent in Canada, but up 138 percent to other countries.

In contrast with some recent years, demand for the various sizes was remarkably consistent in U.S. markets during the 1961–62 coal year. For example, shipments of Pea and larger sizes declined 7 percent; the category consisting of Buckwheat No. 1 and smaller sizes also fell 7 percent. Exclusive of Broken and Egg sizes, declines in shipments of the individual sizes to points in the United States ranged between a decrease of 4 percent for the "other" category to 10 percent for Buckwheat No. 2 (Rice). Except for the South Atlantic States, all major markets in the United States received less tonnage than in the preceding coal year. Shipments to the Middle Atlantic States, the most important tonnage market, fell 6 percent, while the New England and Lake States areas took 15 percent and 17 percent less, respectively. The South Atlantic area, presumably because of increased nonfuel requirements, stepped up receipts by 6 percent over the 1960–61 coal year. Pennsylvania, again because of a relatively stable demand in the producing region, remained the principal market, taking 49 percent of the year's shipments, just 1 percent less than the record set during the 1960–61 coal year. Truck shipments once more set a percentage record, reaching 51 percent of the year's total because of the relatively stable demand in the "local sales" area and a decline of approximately 11 percent in reported rail shipments.

The effect of competition from indigenous and imported liquid and gaseous fuels was fully evident in shipments to Canada. Exports to that country of Pea and larger, the hand-fired sizes, dropped 23 percent below the 1960–61 coal-year level and Buckwheat Nos. 1 and 2 (Rice), the sizes customarily used in stoker installations, fell 28 and 33 percent, respectively. Buckwheat No. 4 and smaller, strictly industrial coals, fared better, declining only 18 percent. In contrast to the 1960–61 coal year, when about two-thirds of the movement overseas consisted of Buckwheat No. 4 and smaller sizes, approximately 75 percent of the coal shipped abroad during the 1961–62 coal year was Pea and larger sizes—primarily because of the relatively large shipments of Egg and Stove coal for use by U.S. armed forces in West Germany. Summarized data on the distribution of Pennsylvania anthracite during the 1961–62 coal year, by sizes, are presented in table 28.

TABLE 28.—Distribution of Pennsylvania anthracite, April 1, 1961, to March 31, 1962 by States, Provinces, and countries of destination in net tons

Destination	Pea and larger						Buckwheat No. 1 and smaller					Total all sizes	Percent of total
	Broken	Egg	Stove	Chestnut	Pea	Total	Buckwheat No. 1	Buckwheat No. 2 (Rice)	Buckwheat No. 3 (Barley)	Other	Total		
United States:													
New England States:													
Connecticut	----------	1,154	36,999	41,233	2,380	81,766	5,698	7,461	7,912	7,584	28,655	110,421	0.7
Maine	----------	1,259	32,294	25,497	755	59,805	4,378	9,812	----------	373	14,563	74,368	.5
Massachusetts	272	15,857	170,516	80,954	11,108	278,707	28,331	34,167	10,270	4,013	76,781	355,488	2.2
New Hampshire	----------	647	18,695	11,231	1,014	31,587	4,133	7,647	----------	80	11,860	43,447	.3
Rhode Island	----------	426	9,955	7,225	428	18,034	4,419	1,656	----------	34	6,109	24,143	.1
Vermont	----------	882	27,025	16,291	3,100	47,298	12,357	18,320	----------	41	30,718	78,016	.5
Total	272	20,225	295,484	182,431	18,785	517,197	59,316	79,063	18,182	12,125	168,686	685,883	4.3
Middle Atlantic States:													
New Jersey	649	8,105	166,662	386,852	138,882	701,150	173,608	122,836	274,035	228,527	799,006	1,500,156	9.5
New York	160	36,671	505,888	427,241	554,410	1,524,370	571,221	241,797	360,995	350,268	1,524,281	3,048,651	19.2
Pennsylvania [1]	1,708	41,609	613,236	1,242,503	1,042,631	2,941,687	1,093,819	917,765	1,259,177	1,607,520	4,878,281	7,819,968	49.4
Total	2,517	86,385	1,285,786	2,056,596	1,735,923	5,167,207	1,838,648	1,282,398	1,894,207	2,186,315	7,201,568	12,368,775	78.1
South Atlantic States: [2]													
Delaware	2,901	3,248	13,765	37,594	6,209	63,717	1,166	607	9,878	12	11,663	75,380	.5
District of Columbia	----------	837	10,947	11,458	1,015	24,257	6,107	596	817	----------	7,520	31,777	.2
Maryland	----------	663	52,264	49,871	2,294	105,092	16,655	2,779	196	274,784	294,414	399,506	2.5
Virginia	----------	106	6,446	5,132	412	12,096	1,816	294	348	788	3,246	15,342	.1
Total	2,901	4,854	83,422	104,055	9,930	205,162	25,744	4,276	11,239	275,584	316,843	522,005	3.3
Lake States: [3]													
Illinois	30	69	3,775	6,125	420	10,419	39,824	8,387	2,547	9,449	60,207	70,626	.4
Michigan	----------	136	6,925	3,704	228	10,993	1,806	6,516	2,233	44,012	54,567	65,560	.4
Minnesota	----------	----------	378	947	228	1,553	149	----------	4	5,183	5,336	6,889	(4)
Ohio	----------	870	1,290	2,830	3,863	8,853	26,311	807	29,274	117,768	174,160	183,013	1.2
Wisconsin	----------	----------	19,802	24,073	1,821	45,696	3,499	3,203	3	39,158	45,863	91,559	.6
Total	30	1,075	32,170	37,679	6,560	77,514	71,589	18,913	34,061	215,570	340,133	417,647	2.6
Other States	71	1,797	3,048	10,320	4,928	20,164	35,144	7,883	8,865	132,041	183,933	204,097	1.3
Total United States	5,791	114,336	1,699,910	2,391,081	1,776,126	5,987,244	2,030,441	1,392,533	1,966,554	2,821,635	8,211,163	14,198,407	89.6

Canada:													
Ontario	----------	3,178	239,504	190,010	50,333	483,025	19,872	22,579	9,049	1,040	52,540	535,565	3.4
Quebec	----------	1,637	59,173	33,699	1,472	95,981	47,423	34,130	38,851	78,647	199,051	295,032	1.8
Other Provinces	90	998	4,855	3,809	3	9,755	86	1,120	7	98	1,311	11,066	.1
Total Canada	90	5,813	303,532	227,518	51,808	588,761	67,381	57,829	47,907	79,785	252,902	841,663	5.3
Other countries	62	209,348	301,234	30,006	60,667	601,317	44,713	3,794	838	152,218	201,563	802,880	5.1
Grand total	5,943	329,497	2,304,676	2,648,605	1,888,601	7,177,322	2,142,535	1,454,156	2,015,299	3,053,638	8,665,628	15,842,950	100.0

---

[1] Includes "Local sales."

[2] Shipments to other States in the South Atlantic area are included in "Other States."

[3] Shipments to Indiana are included in "Other States."

[4] Less than 0.05 percent.

The effect on transportation of increased shipments to overseas countries was reflected in the 1962 calendar-year data released by the Pennsylvania Department of Mines and Mineral Industries. According to this source, rail shipments during 1962 fell only 3 percent below 1961 levels, but the movement by truck declined 7 percent. Based on the same source, New Jersey, Pennsylvania, Virginia, and "Other States," were the only U.S. markets to register gains over 1961 in rail receipts, the others declining from a high of 49 percent for Delaware to 1 percent in Illinois. Except for "Other States" and the District of Columbia, all U.S. markets took less trucked coal than in 1961, the declines ranging from a few hundred tons in Maryland to 350,000 tons in New York and 273,000 tons in the "local sales" area. Truck data for 1962 are shown by months, in table 29 and truck and rail shipments for the period, 1958–62, in tables 30 and 31.

TABLE 29.—Truck shipments of Pennsylvania anthracite in 1962, by months, and by States of destination, in net tons [1]

Destination	January	February	March	April	May	June	July
Pennsylvania:							
Within region	439,061	414,258	345,999	282,148	217,908	195,957	195,825
Outside region	319,300	272,580	249,180	183,875	176,851	202,648	171,782
New York	116,194	98,050	73,483	50,038	46,000	58,657	42,862
New Jersey	69,026	61,414	56,807	36,233	40,236	48,637	30,846
Delaware	8,924	5,826	3,762	2,558	1,358	2,819	1,427
Maryland	14,788	11,003	8,834	2,787	1,216	3,033	2,598
District of Columbia	1,351	1,558	1,187	126	54	14	114
Other States	3,132	3,351	5,369	475	588	1,839	1,485
Total: 1962	971,776	868,040	744,621	558,240	484,211	513,604	446,939
1961	1,063,823	945,056	704,079	637,965	591,536	563,609	473,833

Destination	August	September	October	November	December	Total	Percent of total trucked
Pennsylvania:							
Within region	189,803	222,968	264,496	324,624	378,678	3,471,725	43.4
Outside region	228,506	214,448	271,284	306,259	318,507	2,915,220	36.4
New York	62,350	63,442	72,826	80,343	80,202	844,447	10.6
New Jersey	46,330	45,886	49,709	55,234	51,547	591,905	7.4
Delaware	3,044	2,182	3,028	4,535	4,400	43,863	.5
Maryland	6,240	7,376	8,982	10,519	14,873	92,249	1.2
District of Columbia	57	96	168	749	1,099	6,573	.1
Other States	2,380	2,510	3,859	3,109	4,117	32,214	.4
Total: 1962	538,710	558,908	674,352	785,372	853,423	7,998,196	100.0
1961	594,623	560,028	735,212	781,465	991,322	8,642,551	100.0

[1] Compiled from reports of Pennsylvania Department of Mines and Mineral Industries; does not include dredge coal.

The quantity of anthracite handled by the Lake docks dropped slightly below 1961 levels. Lake Erie loadings totaled 196,000 tons, compared with 221,000 tons in 1961, but loadings over docks on Lake Ontario increased from 19,000 tons to 33,000, an increase of 73 percent. At Upper Lake docks, receipts declined only 1 percent on Lake Superior but fell 34 percent below the 1961 seasonal total on Lake Michigan. The ex-dock movement was also off on both lakes—minus 39 percent at Lake Superior docks and 32 percent at Lake Michigan. Data on the Lake-dock trade are presented by months in table 2.

TABLE 30.—Rail shipments of Pennsylvania anthracite, by destinations, in net tons [1]

Destination	1958	1959	1960	1961	1962
New England States	1, 032, 680	932, 593	712, 780	602, 262	465, 535
New York	2, 995, 230	2, 728, 926	2, 458, 043	2, 267, 861	1, 939, 004
New Jersey	1, 534, 953	1, 178, 965	988, 852	826, 323	858, 587
Pennsylvania	2, 814, 258	2, 449, 545	2, 236, 964	2, 275, 481	2, 309, 182
Delaware	69, 816	57, 597	48, 586	42, 194	21, 373
Maryland	268, 054	185, 073	167, 355	255, 658	182, 222
District of Columbia	39, 901	43, 664	22, 024	19, 561	15, 983
Virginia	32, 378	19, 262	17, 524	14, 158	18, 876
Ohio	148, 711	260, 278	165, 903	174, 620	165, 211
Indiana	35, 540	53, 785	44, 763	46, 650	29, 754
Illinois	81, 090	99, 826	91, 640	76, 348	75, 435
Wisconsin	83, 921	72, 346	60, 737	59, 815	41, 322
Minnesota	10, 011	10, 740	13, 032	8, 636	6, 304
Michigan	30, 723	28, 815	50, 835	55, 218	43, 028
Other States	100, 560	160, 260	154, 586	121, 119	190, 028
Total United States	9, 277, 826	8, 281, 675	7, 233, 624	6, 845, 904	6, 361, 844
Canada	1, 304, 214	1, 311, 841	1, 067, 181	890, 058	713, 336
Other foreign countries	459, 129	187, 883	68, 875	82, 636	516, 376
Grand total	11, 041, 169	9, 781, 399	8, 369, 680	7, 818, 598	7, 591, 556

[1] Compiled from reports of Pennsylvania Department of Mines and Mineral Industries; does not include dredge coal.

TABLE 31.—Truck shipments of Pennsylvania anthracite, by destinations, in net tons [1]

Destination	1958	1959	1960	1961	1962
Pennsylvania:					
Within region	4, 306, 015	3, 904, 608	3, 826, 445	3, 744, 781	3, 471, 725
Outside region	2, 624, 608	2, 704, 972	2, 900, 414	2, 891, 607	2, 915, 220
New York	1, 239, 218	1, 279, 693	1, 217, 342	1, 194, 765	844, 447
New Jersey	714, 060	619, 926	548, 678	641, 329	591, 905
Delaware	42, 169	44, 748	48, 221	45, 310	43, 863
Maryland	103, 899	98, 118	103, 381	92, 837	92, 249
District of Columbia	4, 174	6, 639	6, 232	5, 753	6, 573
Other States	15, 116	13, 669	17, 703	26, 169	32, 214
Total	9, 049, 259	8, 672, 373	8, 668, 416	8, 642, 551	7, 998, 196

[1] Compiled from reports of Pennsylvania Department of Mines and Mineral Industries; does not include dredge coal.

CONSUMPTION

Apparent consumption (production, plus imports, minus exports) of Pennsylvania anthracite in the United States totaled 15 million tons in 1962, a decline of 6 percent from the preceding year. Although use data on anthracite are incomplete, the larger part of the decline apparently was attributable to decreased demand in the space-heating market. Adding credibility to this conjecture was the fact that retail-dealer deliveries decreased 6 percent and sales within the producing region dropped 7 percent, while shipments of Buckwheat No. 1 and smaller sizes, the preponderant part of which are used for various industrial purposes, declined only 3 percent.

At public utility plants, consumption of Pennsylvania anthracite dropped 9 percent, the same percentage of decrease that occurred between 1960 and 1961. In the iron and steel industry, total consumption held close to the 1961 figure, as an increase of 100,000 tons in requirements for coke making was almost equal to the declines recorded for sintering and pelletizing iron ores and other uses. A sharp rise in anthracite consumption occurred at cement plants, where the 1962 total amounted to a gain of 23 percent over consumption in 1961. Consumption by anthracite producers (colliery fuel) also rose sharply (236 percent) as one large producer burned an unusually large amount of bank material to generate electric power.

Monthly data on consumption of anthracite by public-utility and coke plants are shown in table 2. Consumption of anthracite, briquets, coke, heating and range oil, and natural gas is shown in table 32 for those States comprising the primary anthracite marketing area. Data on consumption for several industrial purposes and retail-dealer deliveries are presented in table 33 for the 1955–62 period.

TABLE 32.—Apparent consumption of anthracite and selected competitive fuels in the principal anthracite markets

(Thousand net tons)

Fuel	New England	New York	New Jersey	Pennsylvania	Delaware	Maryland	District of Columbia	Total	Percent of total fuels
Anthracite (all users):[1]									
1959	933	[2] 4,009	[2] 1,799	9,059	102	283	50	16,235	12.3
1960	713	[2] 3,675	[2] 1,537	8,964	97	271	28	15,285	11.2
1961	602	[2] 3,463	[2] 1,468	8,912	88	348	25	14,906	10.5
1962	466	[2] 2,783	[2] 1,451	8,696	65	274	23	13,758	9.3
Imported:[3]									
1959	--------	(4)	--------	--------	--------	--------	--------	(4)	(5)
1960	(4)	(4)	--------	--------	--------	--------	--------	(4)	(5)
1961	(4)	(4)	--------	--------	--------	--------	--------	(4)	(5)
1962	(4)	--------	--------	(4)	--------	--------	--------	(4)	(5)
Briquets (domestic use):									
1959	(4)	(4)	--------	1	--------	1	--------	2	(5)
1960	1	--------	--------	(4)	--------	1	--------	2	(5)
1961	1	--------	--------	(4)	--------	1	--------	2	(5)
1962	(4)	1	1	(4)	--------	1	(4)	3	(5)
Coke (domestic use):									
1959	162	37	116	34	(4)	--------	--------	349	.3
1960	128	30	98	29	(4)	--------	--------	285	.2
1961	108	26	81	23	(4)	--------	--------	238	.2
1962	76	19	70	18	--------	--------	--------	183	.1
Imported:[3]									
1959	(4)	15	--------	--------	--------	--------	--------	15	(5)
1960	(4)	1	--------	--------	--------	--------	--------	1	(5)
1961	(4)	2	--------	--------	--------	--------	--------	2	(5)
1962	(4)	3	--------	--------	--------	--------	--------	3	(5)
Oil (heating and range):[6]									
1959	29,066	27,037	10,896	10,543	1,055	3,824	1,155	83,576	63.6
1960	31,008	27,714	11,201	11,510	991	4,135	1,200	87,759	64.0
1961[7]	32,087	30,285	11,581	11,018	873	4,224	1,015	91,083	63.9
1962	32,891	32,294	12,076	12,433	1,003	4,442	1,092	96,231	64.7
Natural gas:[8]									
1959	3,204	11,017	3,160	11,256	(9)	[9] 2,701	(9)	31,338	23.8
1960	3,516	11,890	3,532	11,913	181	[9] 2,738	(9)	33,770	24.6
1961	3,927	12,834	4,155	12,240	206	[9] 2,887	(9)	36,249	25.4
1962	4,298	13,590	4,551	12,685	[9] 985	2,329	(9)	38,438	25.9
Total:									
1959	33,365	42,115	15,971	30,893	[10] 1,157	[10] 6,809	[10] 1,205	131,515	100.0
1960	35,366	43,310	16,368	32,416	1,269	[10] 7,145	[10] 1,228	137,102	100.0
1961[7]	36,725	46,610	17,285	32,193	1,167	[10] 7,460	[10] 1,040	142,480	100.0
1961	37,731	48,690	18,149	33,832	[10] 2,053	7,046	[10] 1,115	148,616	100.0

[1] Pennsylvania Department of Mines and Mineral Industries.
[2] A part of anthracite shown as shipped to New Jersey is reshipped to New York City.
[3] U.S. Department of Commerce.
[4] Less than 500 tons.
[5] Less than 0.05 percent.
[6] Converted to coal equivalent upon the basis of 4 barrels of fuel oil equaling 1 ton of coal.
[7] Revised.
[8] Converted to coal equivalent upon the basis of 24,190 cubic feet of natural gas equaling 1 ton of coal.
[9] 1959, Delaware and the District of Columbia included with Maryland; 1960–61, the District of Columbia included with Maryland; 1962, the District of Columbia included with Delaware.
[10] 1959, natural gas for Delaware and the District of Columbia included with Maryland; 1960–61, the District of Columbia included with Maryland; 1962, the District of Columbia included with Delaware.

TABLE 33.—Retail dealer deliveries and consumption of Pennsylvania anthracite in the United States, 1955–62, by selected consumer categories

(Thousand net tons)

Year	Retail dealer deliveries [1]	Colliery fuel	Railroads [2]	Electric utilities [3]	Briquet plants	Cement plants	Iron and steel industry		
							Coke making	Sintering and pelletizing [4]	Other [5]
1955	13,019	419	457	3,209	264	199	366	385	443
1956	13,018	342	409	3,296	228	244	377	564	625
1957	10,670	279	361	3,363	156	221	389	868	698
1958	9,386	195	335	2,786	120	183	255	685	686
1959	7,562	129	292	2,629	43	159	369	780	683
1960	6,775	102	248	2,751	31	152	370	754	720
1961	5,070	45	(6)	2,509	28	153	320	588	685
1962	4,767	152	(6)	2,297	(7)	188	420	560	609

[1] Estimated from reports submitted by a selected list of retail dealers. Does not include local sales.

[2] Association of American Railroads.

[3] Federal Power Commission.

[4] Annual Statistical Report, American Iron and Steel Institute.

[5] Annual Statistical Report, American Iron and Steel Institute. Contains a small but not exactly determined amount of anthracite used for sintering.

[6] Not available.

[7] Concealed to avoid disclosure of individual company data.

STOCKS

Data on producers' stocks in gound storage were discontinued with the release of figures for October. By that time, the tonnage held by producers had dropped to only 124,000 tons. As a result, most producing companies experienced difficulty in filling orders, with some falling behind 2 or more weeks on certain sizes, because of the cold weather that gripped much of the country during November and December.

Weather conditions were also reflected in the retail trade. For the first 8 months of 1962, Bureau estimates placed stocks in retail yards outside the producing region at an average of 536,000 tons, about 10 percent less than the monthly average for the same months of 1961. However, for the last 4 months the average monthly figure dropped about 158,000 tons, or 21 percent below the same period of 1961, with stocks on hand at the close of the year (531,000 tons) representing a decline of approximately 26 percent.

Although again consuming less anthracite (9 percent less than in 1961), public utilities maintained inventories at about the same level, the year-end figure of 1,431,000 tons being only 2 percent under the tonnage reported for December 1961. Stocks at Upper Lake docks, as at retail yards, were at an extremely low level by the end of the year. Totaling approximately 21,000 tons on Lakes Superior and Michigan combined, the stocks held on the docks represented not only one of the lowest figures on record but a decline of about 45 percent from December 1961. At coke plants, inventories of anthracite moved upward 17 percent from 98,000 tons in December 1961 to 115,000 tons a year later.

FOREIGN TRADE[3]

According to data of the Bureau of the Census, U.S. Department of Commerce, a total of 1,869,000 short tons of Pennsylvania anthracite was exported in 1962, an increase of 30 percent over 1961. All of the increase was attributable to the trade with Western European countries, since shipments to North American, South American, Asiatic, and Oceanic destinations were less than in 1961.

The Census data on exports (see table 34) indicate that 931,000 tons of anthracite was exported to Europe, a gain of 125 percent over 1961. However, this total apparently excludes all, or the major part of, the industry's shipments to West Germany for the use of the U.S. armed forces, because the Association of American Railroads reported that 1,640,000 tons was dumped at tidewater ports for shipment to Europe. According to Association figures, 694,000 tons was consigned to the U.S. armed forces and 255,000 tons to West Germany. Even on the basis of the lower Census figures the 1962 trade with West Germany represented a substantial increase of 184 percent.

The sharp gain in exports to Belgium-Luxembourg (211 percent) probably reflected the Belgian Government's action in removing restrictions on coal imports as well as the fact that in most of the European Coal and Steel Community countries stocks were depleted and coal production was running below 1961 levels. One of the coldest winters in a century in Western Europe was another factor that contributed to the strong demand for U.S. anthracite abroad. France, which increased its imports of Pennsylvania anthracite by 119 percent, will undoubtedly sharply increase its purchases in 1963, and Italy and the Netherlands, with gains of 106 and 26 percent, respectively, in 1962 also will remain important markets for Pennsylvania anthracite.

Canadian demand for Pennsylvania anthracite continued to decline. The decrease (8 percent), however, was the smallest since 1959, perhaps indicating that the shift away from solid fuels to both imported and indigenous gaseous and liquid fuels is slowing. Exports to other countries were generally down, but only small tonnages were involved. Imports of anthracite into the United States in 1962 totaled 7,583 tons, according to the Bureau of the Census, most of which originated in Canada and entered this country via Montana, Idaho, and Washington. Imports are shown, by customs districts, in table 35.

WORLD PRODUCTION

World production of anthracite totaled 192 million tons in 1962, an increase of about 1 percent over 1961. European production was fairly stable, except for West Germany where estimates placed 1962 output approximately 9 percent lower than in 1961. Significant changes occurred elsewhere, however, as production continued to climb in the Republic of Korea under the stimulus of U.S. aid, and in the United Kingdom as the result of efforts by the National Coal

---

[3] Figures on imports and exports compiled by Mae B. Price and Elsie D. Jackson, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

TABLE 34.—Anthracite exported from the United States, by countries and customs districts

(Net tons)

Country	1961	1962
North America:		
Bahamas		22
Canada	965,576	892,488
Canal Zone		11
El Salvador		219
Haiti		22
Mexico	5,783	5,325
Miquelon		48
Trinidad and Tobago		183
Total	971,359	898,318
South America:		
Argentina	1,901	5,119
Brazil	15,716	10,370
Chile	297	257
Colombia	45	239
Surinam		29
Venezuela	40	201
Total	17,999	16,215
Europe:		
Belgium-Luxembourg	65,912	205,008
Denmark	58	
France	64,347	140,703
Germany, West	[1] 109,642	311,695
Italy	68,073	140,413
Netherlands	105,383	133,183
Total	[1] 413,415	931,002
Asia:		
Cambodia	260	
India	9,551	7,965
Indonesia	65	
Israel	65	9,277
Japan	3,746	
Korea, Republic of	42	
Nansei and Nanpo Islands	234	
Pakistan	21	
Philippines	71	85
Saudi Arabia		71
Turkey		65
Viet-Nam	16,821	5,605
Total	30,876	23,068
Africa: United Arab Republic (Egypt)	84	
Oceania: Australia	1,602	805
Grand total	[1] 1,435,335	1,869,408

Customs district	1961	1962
North Atlantic:		
Connecticut		42
Maine and New Hampshire	167	324
Massachusetts	25	
New York	4,757	4,225
Philadelphia	[1] 594,889	1,080,850
South Atlantic:		
Maryland		3,958
Virginia	5,134	98
Gulf Coast:		
Florida		104
Mobile		29
New Orleans	1,537	1,016
Sabine	9,342	6,283
Mexican border:		
Arizona	93	113
El Paso		19
Laredo	5,627	4,639
Northern border:		
Buffalo	567,464	542,849
Dakota		111
Duluth and Superior	264	404
Michigan	1,202	1,840
Ohio	650	3,793
Rochester	3,148	30,548
St. Lawrence	238,465	186,400
Vermont	2,310	968
Pacific Coast:		
Los Angeles		682
San Diego	24	
Washington	237	113
Total	[1] 1,435,335	1,869,408

[1] Revised figure.

Source: Bureau of the Census.

NOTE.—According to the Association of American Railroads, 1,639,846 net tons was exported to Europe in 1962. Of this total 694,325 tons was consigned to the U.S. armed forces and 254,522 tons to West Germany.

TABLE 35.—Anthracite imported for consumption in the United States, by countries of origin and U.S. customs districts

(Net tons)

Country and customs district	1961	1962
Canada:		
Dakota	19	--------
Galveston	57	--------
Hawaii	100	100
Maine and New Hampshire	--------	203
Canada—Continued		
Montana and Idaho	51	5,530
Washington	565	1,748
Total	792	7,581
New Zealand:		
Philadelphia	--------	2
Total	792	7,583

Source: Bureau of the Census.

Board to modernize and consolidate British coal-mining operations. For the U.S.S.R., the world's leading anthracite producer, 1962 production was estimated at 87 million tons, an increase of 2 percent. Details on world production for the 5-year period, 1958–62, are presented in table 36.

TABLE 36.—World production of anthracite, by countries [1]

(Thousand short tons)

Country	1958	1959	1960	1961	1962
Belgium	7,541	7,059	6,488	6,085	6,345
Bulgaria	128	165	177	210	330
China [2]	11,000	22,000	24,800	22,000	22,000
France	13,529	13,785	13,683	[2] 11,400	[2] 11,300
Germany:					
East [2]	275	275	275	275	275
West	14,011	13,902	13,220	[2] 13,800	[2] 12,500
Ireland	155	171	143	132	136
Italy	49	34	22	26	18
Japan	1,811	1,781	1,987	2,088	2,065
Korea:					
North [2]	4,400	5,500	6,600	7,700	8,300
Republic of	2,944	4,559	5,897	6,486	8,206
Morocco	562	513	454	452	408
Netherlands [2]	4,400	4,400	4,400	4,400	4,400
New Zealand	2	2	1	(3)	(3)
Peru	118	65	34	23	22
Portugal	625	581	480	518	446
Rumania [2]	17	17	17	17	17
South Africa, Republic of	[4] 477	776	709	1,430	1,225
Spain	3,440	2,888	2,771	2,863	2,911
Switzerland [2]	11	11	11	11	11
U.S.S.R.	86,121	87,423	85,995	85,405	[2] 87,000
United Kingdom	4,418	4,039	4,026	3,973	[2] 4,100
United States (Pennsylvania)	21,171	20,649	18,817	17,446	16,894
Viet-Nam:					
North	1,700	2,427	2,860	3,100	[2] 2,900
South	22	22	30	63	78
World total (estimate) [1]	178,900	193,050	193,900	189,900	191,900

[1] This table incorporates a number of revisions of data published in previous anthracite chapters. Data do not add to totals shown because of rounding where estimated figures are included in the detail.

[2] Estimate.

[3] Less than 500 tons.

[4] Reported as sales.

NOTE.—An undetermined amount of semianthracite is included in the figures for some countries.

Compiled by Pearl J. Thompson, Division of Foreign Activities.

TECHNOLOGY

Mining.—The Bureau's hydraulic-mining experiments, conducted with equipment that was installed in a mine of a cooperating company in August 1961, were continued through 1962. The coal seam selected for the work has varied from 10.5 to 16 feet in thickness, and the pitch from 10° to 20°. Many improvements have been made in the Bureau-designed prototype hydraulic jumbo, several directly related to safety. Among these was an especially designed chain conveyor which was installed across the face in front of the monitor to discharge on a room conveyor. The face conveyor is attached to two hydraulic cylinders mounted on the jumbo. These cylinders move the conveyor forward and backward. During the year, improvements resulted in increased production and substantial decreases in loading time and power consumption. Preliminary studies of cutting efficiencies were begun with nozzle openings of various sizes and at pressures and water volumes below the 5,000 psi and 300 gpm previously used.

Plans were underway at the close of the year to determine the feasibility of developing and mining relatively thin anthracite beds on pitches over 30° with an especially designed, large-diameter auger. A preliminary design was approved by the Bureau, and delivery of the unit is expected early in 1963. According to the design, the auger will be crawler-mounted, 11 feet long, 5 feet wide, and 4.5 feet high.

Research on hydraulic hoisting of solid material by pipeline was continued at the Bureau's Anthracite Research Center, Schuylkill Haven, Pa. Two elbows which connected the pressure vessels with the 6-inch hoisting line were replaced by a single well, or boot. The change resulted in a small but significant decrease in the operating time-cycle and a substantial increase in the hoisting capacity of the system. Use of the common well permitted the two lock chambers to discharge their loads simultaneously at a rate of 70 tons per hour. However, sustained operation at this capacity would require two additional chambers. The operation of the lock gates and valves was automated by installing double-solenoid pilot-operated air valves.

Plans are being considered for installing a prototype hydraulic-hoisting system in a cooperating company's mine to be used in conjunction with hydraulic mining.

Preparation.—Ultrafine-grinding experiments were continued to determine the minimum size to which anthracite can be pulverized by mechanical equipment. The ultimate goal is the production of particles of 50 to 5,000 angstroms. Experiments were initiated to develop standard procedures for sampling, screening, density determination, and particle-size analysis of particles ranging in size from 1.00 to 0.5 microns. Tests also were conducted on the suitability of heavy-media equipment for cleaning mixed fine-sized anthracite. Test mixtures ranged from 9/16 to 3/32 inch. Results indicated that higher cleaning efficiency was obtained when sizes were washed individually.

The Glen Alden Corporation completed the major portion of a modernization program at its Huber breaker in Ashley, Pa.[4] When completed early in 1963, the plant is expected to increase the commercial yield and produce a premium, ultra low-ash product when required.

---

[4] Coal Age. Glen Alden Tools up for Higher Efficiency and Market Growth. V. 68, No. 3, March 1963 pp. 81–85.

The Huber program included the replacement of nine cone cleaners with five new heavy-media systems, which included two Wilmot OCC vessels, handling Pea (300-tph rating) and Buckwheat (200 tph) sizes separately. A similar vessel (300 tph) can be operated selectively to recover middlings from the reject of the Egg-Stove-Nut cones or to prepare a premium fuel (7 percent ash or less) in the plus-1-inch sizes. The other two units, one handling Rice and the other Barley, are the first commercial installations of Wilmot's Dyna-Whirlpool Process, a new method designed to fill the gap between flotation processes and heavy-media vessels of the bath type. The heavy-media installations followed by a year the addition of a froth-flotation circuit which salvaged 18–20 tph of Buckwheat No. 6 from the underflow of a Dorr thickener which was formerly pumped to final-refuse areas.

Utilization.—Fundamental and applied research were continued at the Bureau Anthracite Research Center, Schuylkill Haven, Pa. A vacuum system of the type used in measuring surface areas of granular solids by gas-adsorption methods was placed in operation, using CO_2 as the adsorbate for determining anthracite particle surface areas by the Brunauer-Emmett-Teller method. The specific surface of a 60 x 140-mesh, low-volatile anthracite was computed to be 153 m^2/g. Density determinations by helium displacement of high, medium, and low volatile anthracites were conducted under mild and rigorous off-gassing conditions.

Research into the chemical structure of anthracite was concentrated on the properties of products from its oxidation with nitric acid. The tendency of the acid-insoluble residue to peptize when treated with alkaline material served as the basis for a proposed research project to study the feasibility of using the property in a process to disperse ultrafine anthracite.

Under the auspices of the Coal Research Board of the Commonwealth of Pennsylvania, the College of Mineral Industries, Pennsylvania State University, released a special report[5] on the removal of mineral matter from anthracite by high-temperature chlorination. With differing sizes of anthracite, varying chlorine flow rates, chlorination times up to 6 hours, and reaction temperatures up to 1400° C, the carbonaceous phase of anthracite was almost completely unaffected except for the surface areas.

The Pennsylvania State University also undertook another study[6] for the Coal Research Board involving the reactions of various carbons with atomic species. The study was carried out in the following areas: (1) The reaction between carbon, including anthracite, and the products of hydrogen, oxygen, and microwave discharges; and (2) the rearrangement of acetylene, benzene, ethane, ethylene, methane, and naphthalene in a microwave discharge.

Studies of the effects of gamma radiation on anthracite, also its electrical properties, were continued by the Bureau of Mines.

---

[5] Imperial, George R., and P. L. Walker, Jr. Mineral Matter Removal from Anthracite by High Temperature Chlorination. Coal Research Board of the Commonwealth of Pennsylvania, Special Research Rept. SR-31, 1962, 154 pp.

[6] Vastola, F. J., P. L. Walker, Jr., and J. P. Wightman. Reaction of Coal with Atomic Species. Coal Research Board of the Commonwealth of Pennsylvania, Special Research Rept. SR-34, 1962, 48 pp.

Equipment components for the hydrogasification project were installed and readied for testing prior to the beginning of research work.

Investigation of the effect of size, density, shape, and surface characteristics of raw materials on the permeability of metallurgical furnace burdens was extended in the redesigned simulated furnace shaft at the Bureau's Anthracite Research Center to include air flows sufficient to lift or substantially disturb the charge. The average pressure drop showed that burdens with bolster or pillow briquets averaged 11 and 28 percent higher, respectively, than with Chestnut coke.

Research was conducted on the use of calcined pillow- and bolster shaped briquets as blast furnace fuel at the Bureau's experimental blast furnace at Bruceton, Pa. Inspection at the tuyeres showed that the briquets possessed good mechanical strength, moving through the furnace with little breakage. Raceway movement, however, was quite limited. Tests were conducted with a sinter burden at varying air-velocities during which furnace operation was generally satisfactory with the fuel rate varying from 1,417 to 1,457 pounds per ton of metal. Average metal analyses were 1.05 percent silicon and 0.049 percent sulfur for pillow-shaped briquets, and 1.14 percent silicon and 0.035 percent sulfur for bolster-shaped briquets.

Mine Water Control.—One pumping installation and one surface drainage project, approved in prior years, were completed in 1962. A total of 29 projects had been approved by the Secretary of the Interior by the close of 1962. A total of 29 vertical turbine-type (deep-well) pumps, with an aggregate capacity of 143,000 gallons per minute, have been installed under the program. Fourteen surface drainage improvement projects have been completed. These projects, it is estimated, prevent about three billion gallons annually of surface water from seeping into the underlying mine workings and act as stream antipollutant measures in addition to protecting anthracite reserves.

The scope of the mine-water-control program was expanded in 1962 by amendments to the original legislation which authorized the sealing and filling of abandoned anthracite mines in the interest of public health and safety. Several projects are expected to materialize under the amended legislation early in 1963.

Microfilming.—Because of the danger that the mine maps of companies ceasing operations might be lost or destroyed, the Bureau initiated a project in October 1962 to microfilm all available mine maps of the anthracite region. The program is designed to acquire a permanent record of available information on each coal bed in the anthracite region, with associated data such as colliery surface maps and cross-sections.

Coke and Coal Chemicals

By J. A. DeCarlo,[1] E. T. Sheridan,[2] and Maxine M. Otero[3]

⁂

Contents

General summary 211
Salient statistics 214
Statistical summary 215
Scope of report 214
Oven and beehive coke and breeze 218
Production by merchant and furnace plants 218
Production by States 219
Coke breeze 221
Number and type of ovens 222
Quantity and value of coal carbonized 225
Preparation and source of coal 227
Consumption of coke 231

Oven and beehive coke and breeze—Continued

Distribution of oven and beehive coke 238
Stocks of coke and coking coal 239
Value and price 242
Foreign trade 244
World review 245
Technology 247
Coal-chemical materials 255
General summary 255
Coke-oven gas 257
Crude coal tar and derivatives 261
Coke-oven ammonia 264
Crude light oil and derivatives 265

GENERAL SUMMARY

PRODUCTION of oven and beehive coke in the United States increased slightly in 1962, but output was 16 percent less than in the base period, 1957–59. The general rise in industrial activity during the latter half of 1961 continued through the first part of 1962, and coke production in the first quarter was 47 percent greater than in the corresponding period of 1961. The monthly production index for oven coke (1957–59=100) in the first quarter averaged 101, and oven-coke output in January was the highest since May 1960. A decline in industrial activity in the second and third quarters of 1962, however, resulted in a corresponding decrease in coke-oven operations, and the production index declined to 87, 73, and 77 in subsequent quarters. Slot ovens continued to supply the major part of the coke produced in the United States, furnishing 98 percent of the total output. Beehive coke followed the same general production trend as oven coke, with peak production also in the first quarter of 1962. Beehive-coke production, however, was 8 percent lower than in 1961 and 35 percent lower than average annual output in 1957–59.

---

[1] Chief, Section of Coke and Coal Chemicals.
[2] Supervisory mineral analyst.
[3] Supervisory statistical assistant.

Demand for coke was firm throughout the year, and producers' stocks were reduced by 3 percent. Despite increased production and lower exports, apparent consumption in 1962 was slightly less than in 1961 because less coke was withdrawn from stocks. Blast furnaces continued as the leading consumer, receiving 91 percent of the total coke distributed by producers in the United States. Shipments to blast furnaces decreased 1 percent, however, because of lower coke rates. Because coke used for pig iron production is one of the major cost items of the steelmaking process, efforts to reduce the coke rate at blast furnaces continued in 1962 and resulted in the lowest coke rate to date—1,395.2 pounds of coke consumed for each ton of pig iron and ferroalloys produced. This was a decrease of 37.4 pounds from the 1961 coke rate and 239.2 pounds less than the rate in 1957–59. In terms of the quantities of coke involved in this reduction, according to the American Iron and Steel Institute, coke consumption by blast furnaces in 1962 decreased by 526,000 tons, while pig iron and ferroalloys production increased by nearly 1 million tons. The coke rate has declined steadily since 1950 because of the application of a combination of improvements in blast-furnace technology. These included not only improvements in burden materials, such as beneficiated ores and higher quality coke, but also changes in operating practices, such as the use of higher blast temperatures, oxygen enrichment and humidification of the blast, and high top pressures. Another innovation that has contributed to the reduced coke rate in the past few years and should substantially lower coke rates in the future is the injection of supplemental fuels (gaseous, liquid, and pulverized solid). Furnaces currently operating with supplemental fuels have much lower coke rates than other furnaces operating with comparable burdens and under similar conditions but not using this technique.

The remaining 9 percent of the coke distributed by producers in the United States in 1962 was sold for residential heating, to foundries, to producer- and water-gas plants, and to miscellaneous industrial plants. The foundry-coke market remained stable and accounted for 5 percent of the total. Shipments to foundries increased 9 percent over those in 1961 but were at about the same level as in 1957–59. Shipments of other industrial coke increased 2 percent. This coke represented 4 percent of the total distributed in the United States and included coke consumed for chemical processing, nonferrous smelting, and various other industrial purposes. The amount of coke used for residential heating and gas manufacture continued to decline. Consumption by producer- and water-gas plants, which furnished the third largest coke market in the 1940's, decreased 21 percent from the 1961 level, and the market is now virtually nonexistent. The amount of coke used for residential heating also decreased 19 percent, and this market, which in 1940 consumed 14 percent of the total coke, now receives less than 1 percent.

Imports of coke increased slightly and totaled 142,000 tons. Exports, however, decreased 11 percent. Of the 394,000 tons of coke exported, 79 percent was shipped to Canada, and the remaining 21 percent was shipped to 20 other countries.

Production of coke screenings, termed breeze, increased 2 percent. Breeze is used as an industrial fuel for a variety of purposes, but the major quantities are consumed by producers in steam-raising and agglomerating plants. For many years breeze was used primarily for generating steam at or near producing plants. The consumption pattern has shifted in recent years, however, and the largest quantities are now used for agglomerating iron ores. According to data supplied by producers, 53 percent of the 2.8 million tons of breeze consumed by producers in 1962 was used in agglomerating plants, 26 percent was used for steam raising, and the remaining 21 percent was used for a variety of other industrial purposes. The demand for breeze for chemical processing, particularly for smelting phosphate rock, continued in 1962, and an additional 816,000 tons of breeze was sold by producers.

Coking-coal costs remained relatively stable in 1962, and the average value per ton of all coal carbonized in coke plants was only slightly higher than in 1961. Virtually all coal carbonized was bituminous, having an average delivered value for all plants of $9.77 per ton. Coal carbonized in slot ovens increased $0.06 per ton to $9.85. Coal carbonized in beehive ovens, however, decreased $0.79 per ton to $5.31. Since beehive plants are located at or near the source of the coal consumed, coal costs are roughly equal to f.o.b. mine prices because transportation charges are negligible.

Yields of basic chemicals and gas were lower in 1962 than in 1961, and all except tar registered decreased in production. The decreases were small, however, because more coal was carbonized. Light-oil production declined by 1 percent; output of gas, by 2 percent; and ammonia (in terms of sulfate equivalent), by 3 percent. Tar production, however, increased 3 percent. Although yields of products derived from light oil were comparable to those in 1961 or better, less light oil was refined in 1962, and output of benzene, toluene, and solvent naphtha also declined. However, production of xylene and other light-oil derivatives increased slightly.

Sales of ammonium sulfate and most of the light-oil derivatives were higher than production, and inventories decreased accordingly. Stocks of ammonium sulfate were reduced by 40 percent, and stocks of benzene, by 28 percent. However, the prices of both products decreased in 1962. According to the Oil, Paint and Drug Reporter magazine, the price of ammonium sulfate, f.o.b. plant, decreased from $32 per ton to $28 per ton in July and remained at this level through December. The price of benzene declined from $0.31 to $0.28 per gallon in January and dropped another $0.03 per gallon in April, where it remained for the rest of the year.

The total value of the coal carbonized was slightly higher than in 1961 and totaled $730 million. The value of all coal-chemical materials used and sold and of coke and breeze produced was $1,228 million, 68 percent more than the value of the coal carbonized. The value of coke and breeze produced was 78 percent of the total value of all products.

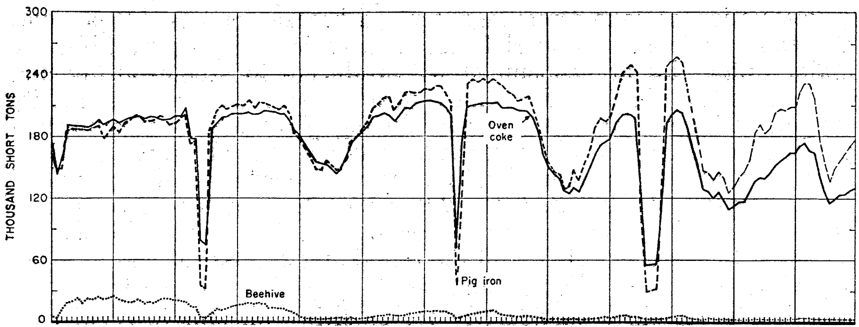


Figure 1.—Average daily production of oven and beehive coke and pig iron in the United States, by months.

TABLE 1.—Salient coke statistics in the United States

	1957–59 (average)	1960	1961	1962
United States:				
Production:				
Oven coke..........short tons..	60,551,900	56,219,108	50,830,409	51,098,420
Beehive coke..............do....	1,254,232	1,009,610	880,778	811,872
Total....................do....	61,806,132	57,228,718	51,711,187	51,910,292
Imports......................do....	120,908	126,345	126,518	141,883
Exports......................do....	558,428	353,016	445,232	394,296
Producers' stocks, Dec. 31....do....	[1] 4,682,436	4,738,088	4,041,873	3,906,811
Consumption, apparent......do....	60,585,947	56,946,395	52,088,688	51,792,941
Ovens:				
Slot in existence, Dec. 31........	[1] 15,993	15,320	15,224	14,535
Beehive in existence, Dec. 31....	[1] 7,448	7,583	5,702	4,979
Value of coal-chemical materials used or sold..............................	$330,902,284	$306,745,388	$279,349,011	$264,739,789
Value of coke and breeze produced..	1,143,589,918	1,075,444,111	943,542,537	963,211,681
Total value of all products........	1,474,492,202	1,382,189,499	1,222,891,548	1,227,951,470
World production:				
Hard coke....thousand short tons..	287,855	308,107	304,470	301,474
Gashouse and low-temperature coke........thousand short tons..	51,130	50,340	49,430	49,540

[1] 1959.

SCOPE OF REPORT

This chapter covers high-temperature oven and beehive coke and related products. All data, except where noted, were supplied by coke-producing companies in the United States. Only products made in high-temperature slot and beehive ovens were included; products made by other carbonization processes (coal-gas retorts, low-temperature coal carbonization, and carbonization of residues from the refining of coal tar and petroleum) were specifically excluded. Approximately 15.7 million tons of petroleum coke and 18,000 tons of pitch coke were produced in 1962.

In addition to coke produced in high-temperature slot and beehive ovens, five companies produced 164,000 tons of coke and char in unconventional carbonizing units, and two other companies operated experimental plants. Of the five producers, one manufactured high-

TABLE 2.—Statistical summary of the coke industry in the United States in 1962

	Slot ovens	Beehive ovens	Total
Coke produced—			
At merchant plants:			
Short tons	5, 438, 368	(1)	(1)
Value	$118, 590, 948	(1)	(1)
At furnace plants:[2]			
Short tons	45, 660, 052	(1)	(1)
Value	$808, 473, 620	(1)	(1)
Total:			
Short tons	51, 098, 420	811, 872	51, 910, 292
Value	$927, 064, 568	$12, 146, 630	$939, 211, 198
Breeze produced:			
Short tons	3, 424, 720	43, 433	3, 468, 153
Value	$23, 781, 913	$218, 570	$24, 000, 483
Coal carbonized:			
Bituminous:			
Short tons	72, 923, 327	1, 338, 862	74, 262, 189
Value	$718, 288, 318	$7, 105, 675	$725, 393, 993
Average per ton	$9. 85	$5. 31	$9. 77
Anthracite:			
Short tons	419, 520	---	419, 520
Value	$4, 382, 156	---	$4, 382, 156
Average per ton	$10. 45	---	$10. 45
Total:			
Short tons	73, 342, 847	1, 338, 862	74, 681, 709
Value	$722, 670, 474	$7, 105, 675	$729, 776, 149
Average per ton	$9. 85	$5. 31	$9. 77
Average yield in percent of total coal carbonized:			
Coke	69. 67	60. 64	69. 51
Breeze (at plants actually recovering)	4. 67	5. 95	4. 68
Coke used by producing companies—			
In blast furnaces:			
Short tons	44, 350, 270	(3)	44, 350, 270
Value	$782, 227, 676	(3)	$782, 227, 676
In foundries:			
Short tons	226, 630	---	226, 630
Value	$7, 065, 550	---	$7, 065, 550
For producer- and water-gas manufacture:			
Short tons	52, 960	---	52, 960
Value	$996, 969	---	$996, 969
For other industrial uses:			
Short tons	379, 348	(3)	379, 348
Value	$7, 135, 799	(3)	$7, 135, 799
Breeze used by producing companies—			
In steam plants:			
Short tons	720, 466	---	720, 466
Value	$4, 555, 341	---	$4, 555, 341
In agglomerating plants:			
Short tons	1, 471, 530	---	1, 471, 530
Value	$10, 019, 160	---	$10, 019, 160
For other industrial uses:			
Short tons	594, 997	---	594, 997
Value	$4, 112, 505	---	$4, 112, 505
Coke sold (commercial sales)—			
To blast furnaces:			
Short tons	2, 274, 779	268, 986	2, 543, 765
Value	$36, 357, 938	$3, 982, 031	$40, 339, 969
Average per ton	$15. 98	$14. 80	$15. 86
To foundries:			
Short tons	2, 296, 165	7, 551	2, 303, 716
Value	$69, 469, 710	$106, 826	$69, 576, 536
Average per ton	$30. 25	$14. 15	$30. 20
To water-gas plants:			
Short tons	30, 164	---	30, 164
Value	$568, 243	---	$568, 243
Average per ton	$18. 84	---	$18. 84
To other industrial plants:			
Short tons	1, 156, 293	538, 401	1, 694, 694
Value	$18, 851, 665	$8, 100, 469	$26, 952, 134
Average per ton	$16. 30	$15. 05	$15. 90
For residential heating:			
Short tons	459, 099	(4)	459, 099
Value	$6, 474, 060	(4)	$6, 474, 060
Average per ton	$14. 10	(4)	$14. 10
Breeze sold (commercial sales):			
Short tons	772, 623	43, 733	816, 356
Value	$6, 073, 502	$219, 324	$6, 292, 826
Average per ton	$7. 86	$5. 02	$7. 71

See footnotes at end of table.

TABLE 2.—Statistical summary of the coke industry in the United States in 1962—Continued

	Slot ovens	Beehive ovens	Total
Coal-chemical materials:			
Crude tar:			
Production_____gallons__	650,111,702		650,111,702
Yield per ton of coal_____do____	8.36		8.36
Ammonia: [5]			
Production_____short tons__	670,630		670,630
Yield per ton of coal_____pounds__	18.65		18.65
Crude light oil:			
Production_____gallons__	211,687,939		211,687,939
Yield per ton of coal_____do____	2.94		2.94
Gas:			
Production_____thousand cubic feet__	766,102,074		766,102,074
Yield per ton of coal_____do____	10.45		10.45
Burned in coking process_____percent__	35.41		35.41
Surplus used or sold_____do____	63.16		63.16
Wasted_____do____	1.43		1.43
Value of coal-chemical materials sold:			
Crude tar and derivatives:			
Used_____	$29,592,384		$29,592,384
Sold_____	$62,184,318		$62,184,318
Ammonia products [6]_____	$20,992,467		$20,992,467
Crude light oil and derivatives [7]_____	$39,973,451		$39,973,451
Surplus gas_____	$111,997,169		$111,997,169

[1] Not separately recorded.
[2] Plants associated with iron blast furnaces. (Refer to definition in "Scope of Report".)
[3] Included with sales to avoid disclosing individual company data.
[4] Included with sales "To other industrial plants" to avoid disclosing individual company data.
[5] In terms of sulfate equivalent.
[6] Includes ammonium sulfate, ammonia liquor (NH_3 content), and diammonium and monoammonium phosphate.
[7] Includes intermediate light oil.

TABLE 3.—Summary of oven-coke operations in the United States in 1962, by States

State	In existence Dec. 31 [1]		Coal carbonized (short tons)	Yield of coke from coal (percent)	Coke produced (short tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Alabama_____	7	1,516	5,681,936	72.33	4,109,628	$83,868,538	$20.41
California, Colorado, and Utah_____	3	773	3,832,609	62.78	2,406,276	58,725,006	24.40
Connecticut, Maryland, New Jersey, and New York_	6	1,752	9,342,484	69.57	6,499,514	116,754,315	17.96
Illinois_____	6	568	2,845,846	67.38	1,917,391	36,357,236	18.96
Indiana_____	5	2,218	10,106,509	69.53	7,027,014	137,933,130	19.63
Kentucky, Missouri, Tennessee, and Texas_____	5	438	2,502,843	70.80	1,772,084	32,961,929	18.60
Michigan_____	4	682	4,340,185	72.92	3,164,917	56,759,076	17.93
Minnesota and Wisconsin_____	3	380	999,234	75.76	757,032	17,425,514	23.02
Ohio_____	12	1,820	9,791,455	69.95	6,848,812	113,492,113	16.57
Pennsylvania_____	12	3,720	20,025,333	69.84	13,985,742	228,866,091	16.36
West Virginia_____	3	668	3,874,413	67.37	2,610,010	43,921,620	16.83
Total 1962_____	66	14,535	73,342,847	69.67	51,098,420	927,064,568	18.14
At merchant plants_____	17	1,894	7,630,364	71.27	5,438,368	118,590,948	21.81
At furnance plants_____	49	12,641	65,712,483	69.48	45,660,052	808,473.620	17.71
Total 1961_____	71	15,224	72,705,165	69.91	50,830,409	904,933,173	17.80

[1] Excludes plants retired permanently during year.

grade, high-temperature metallurgical coke from noncoking bituminous coal in a multistage process that included briquetting. Another producer carbonized lignite in a Lurgi gasifier and manufactured briquets from the char. Two plants produced high-temperature coke with traveling-grate stokers, and one plant produced low-temperature coke in retorts.

TABLE 4.—Summary of beehive-coke operations in the United States in 1962, by States

State	In existence Dec. 31[1]		Coal carbonized (short tons)	Yield of coke from coal (percent)	Coke produced (short tons)	Value of coke at ovens	
	Plants	Ovens				Total	Per ton
Pennsylvania	20	3,918	630,270	61.06	384,839	$5,261,371	$13.67
Kentucky, Virginia, and West Virginia	7	1,061	708,592	60.27	427,033	6,885,259	16.12
Total:							
1962	27	4,979	1,338,862	60.64	811,872	12,146,630	14.96
1961	36	5,702	1,496,106	58.87	880,778	13,285,323	15.08

[1] Excludes plants retired permanently during year.

Of the 71 oven-coke plants surveyed by the Bureau of Mines in 1962, 64 were active all year, 5 were idle all year, and 2 were active part of the year but were later closed permanently. One of the idle plants, inactive since 1958 but maintained in standby condition, was abandoned in 1962. Of the 38 beehive plants surveyed, only 13 operated the entire year, 3 were active part of the year, and the remainder were idle.

The terms "merchant" and "furnace" in this chapter apply only to oven-coke plants. Furnace plants are owned by, or are financially affiliated with, iron and steel companies that produce coke mainly for use in their blast furnaces. Merchant plants include those that manufacture metallurgical, industrial, and residential-heating grades of coke for sale on the open market; those associated with chemical companies or gas utilities; and those affiliated with local iron works that consume only a small part of their output in affiliated blast furnaces.

Data on plant capacities, published annually since 1880 for beehive-coke plants and since 1893 for oven-coke plants, were not shown for 1961 and 1962 because a large segment of the oven-coke industry reported that this information was no longer available for publication.

Although data were not available on the manufacturing costs of coke and coal chemicals, this chapter shows the delivered values of coals carbonized and plant values of products produced and sold. The average values shown for coals carbonized were based upon market values assigned by coke producers to all coal received, whether obtained from captive or commercial mines. The average values of oven and beehive coke produced (including coke used by producers and coke sold) were based upon reports from producers showing receipts, f.o.b. plant, for commercial sales and upon prevailing market values for coke consumed by producers. Average values for coal chemicals were based upon the total realization, f.o.b. plant, from commercial sales of the various commodities.

In this chapter, "coke" refers only to large sizes (usually one-half inch plus) from which smaller sizes (breeze) have been screened. "Metallurgical coke" refers to grades used for smelting and casting ferrous metals in blast furnaces and foundries. The standard unit of measurement is the short ton of 2,000 pounds.

OVEN AND BEEHIVE COKE AND BREEZE

TABLE 5.—Production of oven and beehive coke in the United States, by months [1]

(Short tons)

Month	1957-59 (average)		1960		1961		1962	
	Total	Daily average	Total	Daily average	Total	Daily average	Total	Daily average
Oven coke:								
January	5,630,000	181,600	6,203,700	200,100	3,494,400	112,700	5,273,400	170,100
February	5,159,400	184,300	5,936,000	204,700	3,297,800	117,800	4,866,900	173,800
March	5,744,700	185,300	6,261,600	202,000	3,655,300	117,900	5,154,100	166,300
April	5,378,300	179,300	5,672,200	189,100	3,798,700	126,600	4,926,300	164,200
May	5,532,400	178,500	5,290,600	170,700	4,251,100	137,100	4,451,800	143,600
June	5,352,800	178,400	4,558,000	152,000	4,211,300	140,400	3,786,800	126,200
July	4,603,300	148,500	3,987,100	128,600	4,320,200	139,400	3,550,400	114,500
August	4,151,700	133,900	3,935,900	127,000	4,465,700	144,100	3,690,900	119,100
September	4,121,500	137,400	3,604,500	120,100	4,558,400	152,000	3,691,300	123,100
October	4,340,000	140,000	3,891,400	125,600	4,863,800	156,900	3,850,900	124,200
November	5,002,600	166,800	3,496,100	116,600	4,822,300	160,700	3,822,600	127,400
December	5,535,200	178,500	3,382,000	109,100	5,091,400	164,300	4,033,000	130,100
Total	60,551,900	165,900	56,219,100	153,600	50,830,400	139,300	51,098,400	140,000
Beehive coke:								
January	132,200	4,300	121,000	3,900	63,100	2,100	102,200	3,300
February	127,900	4,500	132,100	4,500	60,300	2,100	93,900	3,400
March	150,300	4,900	139,600	4,500	68,500	2,200	97,600	3,100
April	138,900	4,600	104,400	3,500	66,200	2,200	70,400	2,400
May	118,700	3,800	80,900	2,600	80,700	2,600	59,000	1,900
June	107,900	3,600	60,500	2,000	78,500	2,600	54,100	1,800
July	80,000	2,600	52,700	1,700	72,300	2,300	43,800	1,400
August	82,600	2,700	78,100	2,500	84,200	2,700	50,400	1,600
September	78,600	2,600	62,300	2,100	73,000	2,400	51,900	1,700
October	75,300	2,400	56,600	1,800	81,000	2,600	63,900	2,100
November	76,100	2,500	60,900	2,100	75,000	2,500	65,900	2,200
December	85,700	2,800	60,500	1,900	78,000	2,500	58,800	1,900
Total	1,254,200	3,400	1,009,600	2,800	880,800	2,400	811,900	2,200
Total:								
January	5,762,200	185,900	6,324,700	204,000	3,557,500	114,800	5,375,600	173,400
February	5,287,300	188,800	6,068,100	209,200	3,358,100	119,900	4,960,800	177,200
March	5,895,000	190,200	6,401,200	206,500	3,723,800	120,100	5,251,700	169,400
April	5,517,200	183,900	5,776,600	192,600	3,864,900	128,800	4,996,700	166,600
May	5,651,100	182,300	5,371,500	173,300	4,331,800	139,700	4,510,800	145,500
June	5,460,700	182,000	4,618,500	154,000	4,289,800	143,000	3,840,900	128,000
July	4,683,300	151,100	4,039,800	130,300	4,392,500	141,700	3,594,200	115,900
August	4,234,300	136,600	4,014,000	129,500	4,549,900	146,800	3,741,300	120,700
September	4,200,100	140,000	3,666,800	122,200	4,631,400	154,400	3,743,200	124,800
October	4,415,300	142,400	3,948,000	127,400	4,944,800	159,500	3,914,800	126,300
November	5,078,700	169,300	3,557,000	118,700	4,897,300	163,200	3,888,500	129,600
December	5,620,900	181,300	3,442,500	111,000	5,169,400	166,800	4,091,800	132,000
Total	61,806,100	169,300	57,228,700	156,400	51,711,200	141,700	51,910,300	142,200

[1] Daily average calculated by dividing monthly production by number of days in month.

PRODUCTION BY MERCHANT AND FURNACE PLANTS

In 1962, 89 percent of the total oven coke, most of which was used in affiliated blast furnaces, was produced in furnace plants. Both merchant and furnace plants produced approximately the same quantities of coke as in 1961. Production by merchant plants has declined steadily, however, and the 1962 output of merchant plants was only 11 percent of the total, whereas several decades ago, it ranged from 20 to 25 percent of the total.

Tables 6 and 7 give production data for merchant and furnace plants for selected years, and figure 2 shows the percentage of the total coke produced by each type of plant from 1920 through 1962. Peak production was reached by merchant plants during World War

II when annual output ranged between 14 and 15 million tons. In the years immediately preceding World War II, merchant plants produced less coke, but they supplied a larger proportion of the total output. In addition to the coke they sold to blast furnaces, foundries, and the chemical-processing industries, there were large markets for coke for residential heating and for gas manufacture. In fact, more than one-half of the 11 million tons of coke produced by merchant plants in 1939 was sold for residential heating. Just previous to World War II, however, natural gas and fuel oil began to replace coke as fuel for domestic and commercial space heating. Although the war temporarily halted this shift, the conversion continued in postwar years, and pipelines were extended to virtually all sections of the country. By 1962, less than 500,000 tons of coke was sold for space heating. The market for producer- and water-gas coke, firm until about 1950, also declined because of the inroads made by oil and gas. Currently, this market consumes less than 100,000 tons of coke annually, whereas in 1948, 4.5 million tons of coke was consumed by plants manufacturing water gas for residential heating and chemical processing. As a result, 25 merchant plants have been abandoned since 1939, and output from merchant plants has decreased about 50 percent.

Production at furnace plants in 1962 was 30 percent below the peak attained in 1957 and 14 percent less than average annual production in 1957–59. The decline in furnace-plant production from the base period was caused chiefly by the lower coke rates of blast furnaces.

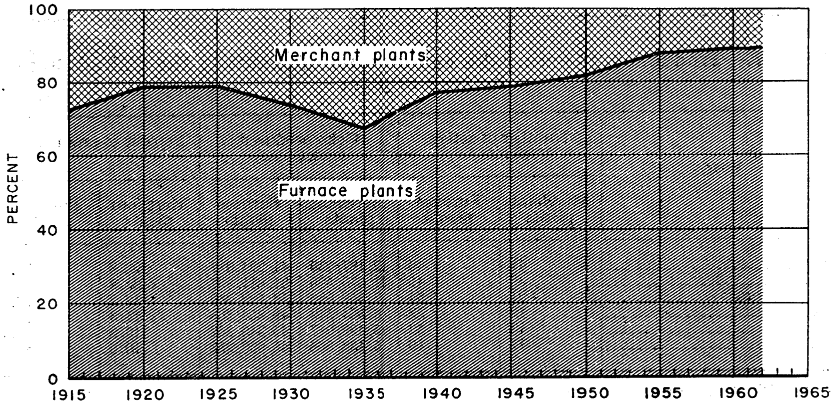


FIGURE 2.—Production of oven coke in the United States, by type of plant.

PRODUCTION BY STATES

Coke was produced in 21 States in 1962, the same number that produced coke in 1961, but 1 less than the number that had active plants during 1957–59. (Massachusetts ceased to be a coke-producing State in 1960 when Eastern Gas and Fuel Associates abandoned its coking operation at Everett.) Because most coke produced in the United States is used for metallurgical fuel, the coke industry is

TABLE 6.—Production of oven coke in the United States, by type of plant

(Short tons)

Month	1957-59 (average)		1960		1961		1962	
	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants
Production:								
January	705,700	4,924,300	649,400	5,554,300	467,400	3,027,000	512,600	4,760,800
February	641,100	4,518,300	618,500	5,317,500	425,100	2,872,700	490,300	4,376,600
March	681,400	5,063,300	654,600	5,607,000	463,400	3,191,900	523,500	4,630,600
April	612,900	4,765,400	616,500	5,055,700	469,600	3,329,100	485,200	4,441,100
May	609,800	4,922,600	534,800	4,755,800	474,200	3,776,900	454,400	3,997,400
June	575,800	4,777,000	497,200	4,060,800	455,400	3,755,900	405,700	3,381,100
July	569,100	4,034,200	465,700	3,521,400	416,500	3,903,700	378,000	3,172,400
August	573,200	3,578,500	466,600	3,469,300	425,100	4,040,600	415,100	3,275,800
September	572,900	3,548,600	443,900	3,160,600	436,500	4,121,900	412,200	3,279,100
October	586,000	3,754,000	497,200	3,394,200	465,600	4,398,200	433,600	3,417,300
November	582,700	4,419,900	455,800	3,040,300	475,600	4,346,700	444,300	3,378,300
December	649,000	4,886,200	464,300	2,917,700	515,600	4,575,800	483,500	3,549,500
Total	7,359,600	53,192,300	6,364,500	49,854,600	5,490,000	45,340,400	5,438,400	45,660,000
Daily average:								
January	22,800	158,800	20,900	179,200	15,100	97,600	16,500	153,600
February	22,900	161,400	21,300	183,400	15,200	102,600	17,500	156,300
March	22,000	163,300	21,100	180,900	14,900	103,000	16,900	149,400
April	20,400	158,900	20,600	168,500	15,600	111,000	16,200	148,000
May	19,700	158,800	17,300	153,400	15,300	121,800	14,700	128,900
June	19,200	159,200	16,600	135,400	15,200	125,200	13,500	112,700
July	18,400	130,100	15,000	113,600	13,500	125,900	12,200	102,300
August	18,500	115,400	15,100	111,900	13,700	130,400	13,400	105,700
September	19,100	118,300	14,800	105,300	14,600	137,400	13,800	109,300
October	18,900	121,100	16,100	109,500	15,000	141,900	14,000	110,200
November	19,400	147,400	15,200	101,400	15,800	144,900	14,800	112,600
December	20,900	157 600	15,000	94,100	16,700	147,600	15,600	114,500
Average for year	20,200	145,700	17,400	136,200	15,100	124,200	14,900	125,100

TABLE 7.—Production of oven coke and number of plants in the United States by type of plant

Year	Number of active plants[1]		Coke produced (short tons)		Percent of production	
	Merchant plants	Furnace plants	Merchant plants	Furnace plants	Merchant plants	Furnace plants
1929	41	46	12,187,439	41,224,387	22.8	77.2
1939	39	45	11,070,506	31,811,807	25.8	74.2
1957-59 (average)	[2] 21	[2] 54	7,359,600	53,192,300	12.2	87.8
1960	19	53	6,364,540	49,854,568	11.3	88.7
1961	18	52	5,490,047	45,340,362	10.8	89.2
1962	17	49	5,438,368	45,660,052	10.6	89.4

[1] Includes plants operating any part of year.
[2] Dec. 31, 1959.

concentrated in the steel-producing areas of the Eastern and North-Central States, and in 1962, 93 percent of the total coke was produced in 15 States east of the Mississippi River.

Pennsylvania was the leading coke producer with 28 percent of the total output. Pennsylvania's production was 4 percent greater than in 1961, but was 15 percent less than in 1957–59 because of smaller requirements by blast furnaces within the State. Indiana continued as the second leading producer despite an 8-percent decrease in output from 1961 production, and Ohio ranked third. Ohio's production increased 2, percent although two plants were abandoned and the number of existing ovens was decreased by 25 percent. The combined output of Pennsylvania, Indiana, and Ohio was more than one-half of the total produced in the United States.

Other large producers were Alabama, Maryland, Michigan, New York, and West Virginia. Each State produced more than 2 million tons of coke.

Eight plants in six States west of the Mississippi River produced approximately 4 million tons of coke. Their combined output, however, was less than that of Alabama and only about one-fourth as large as the production of Pennsylvania. The coke industry expanded to the Southwest and the west coast during World War II, when iron and steel plants with coking operations were constructed in California and Texas to supply increased requirements for iron and steel products in those areas. California, with one plant, had the largest production of the Western States in 1962; Texas had two plants and ranked third among the western producers. Production of oven and beehive coke by States is shown in table 8.

TABLE 8.—Production of coke in the United States, by States

(Short tons)

State	1957-59 (average)	1960	1961	1962
Oven coke:				
Alabama	5, 024, 645	4, 897, 286	3, 949, 927	4, 109, 628
California, Colorado, and Utah	2, 701, 547	2, 840, 131	3, 017, 217	2, 406, 276
Connecticut, Maryland, New Jersey, and New York	[1] 7, 821, 854	[1] 7, 071, 167	6, 234, 321	6, 499, 514
Illinois	2, 291, 276	1, 971, 107	1, 841, 273	1, 917, 391
Indiana	8, 148, 294	8, 024, 273	7, 666, 870	7, 027, 014
Kentucky, Missouri, Tennessee, and Texas	2, 097, 415	1, 972, 816	1, 730, 069	1, 772, 084
Michigan	3, 166, 295	3, 278, 739	2, 958, 342	3, 164, 917
Minnesota and Wisconsin	1, 058, 305	836, 072	713, 769	757, 032
Ohio	8. 871, 503	8, 423, 246	6, 703, 475	6, 848, 812
Pennsylvania	15, 935, 874	14, 146, 269	13, 320, 866	13, 985, 742
West Virginia	3, 434, 892	2, 758, 002	2, 694, 280	2, 610, 010
Total	60, 551, 900	56, 219, 108	50, 830, 409	51, 098, 420
Beehive coke:				
Pennsylvania	895, 358	684, 250	453, 989	384, 839
Kentucky, Virginia, and West Virginia	[2] 358, 874	[3] 325, 360	426, 789	427, 033
Total	1, 254, 232	1, 009, 610	880, 778	811, 872
Grand total	61, 806, 132	57, 228, 718	51, 711, 187	51, 910, 292

[1] Includes Massachusetts.
[2] Includes Utah.
[3] Excludes Kentucky.

COKE BREEZE

In addition to the 51.9 million tons of large-size coke produced in 1962, 3.5 million tons of coke screenings, commonly called breeze, was also produced. In the past, this material, which is unsuitable for most metallurgical applications, was used chiefly by producers for steam raising. In recent years, however, new uses have been developed for breeze, and currently only about one-fourth of the production is used for boiler fuel. Producers continue to consume the bulk of the breeze output, but more than one-half of the breeze now consumed by producing companies is used for sintering iron ore.

Breeze usually consists of sizes ranging from zero to one-half inch, but there is no established screen size, and sizes vary with local conditions. Yields of breeze also vary, but the average quantity of breeze recovered from each ton of coal carbonized in 1962 was 0.05 ton, or 5 percent. Virtually all breeze was produced by oven-coke plants. Few beehive plants have recovery facilities so that the small-sized coke is usually discarded.

Table 9 shows the production and uses of breeze, by States, in 1962. Of the 2.8 million tons used by producers, 53 percent was used in agglomerating plants, 26 percent in steam plants, and 21 percent for other plant uses. The quantity used in agglomerating plants, as shown in table 10, includes only the breeze that was produced at coke plants.

Approximately one-fourth of the breeze produced in 1962 was sold on the commercial market. Exact data on end use were not available, but the major consumers were plants that manufactured elemental phosphorus. Breeze consumption by phosphorus plants in 1962 was estimated at 650,000 to 700,000 tons. This quantity, however, included an undetermined amount of industrial-size coke that was purchased and crushed because adequate supplies of breeze were not available in all areas.

The average value per ton, f.o.b. plant, for breeze sold in 1962 was $7.71, compared with an average value of $20.62 for all grades of industrial-size coke, including a small percentage of coke used for residential heating.

NUMBER AND TYPE OF OVENS

Slot Ovens.—The number of slot ovens in the United States, active and inactive, continued to decrease, and on December 31, 1962, there were 689 fewer ovens than on the same date in 1961. Although 190 new ovens were built during 1962, 879 were taken out of production, the largest number in any one year with the exception of 1960. There were, however, 75 ovens under construction as of December 31, 1962, and in addition, 87 of the 879 ovens retired were scheduled to be rebuilt or to be replaced with completely new ovens. The number of ovens constructed or rebuilt, abandoned, under construction, and in existence in each State at the end of 1962 is shown in table 11.

The age of slot ovens at merchant and furnace plants, shown in table 12, reflects the relative amount of construction and modernization completed for each group of plants. Approximately three-fourths of the total ovens currently in existence are less than 25 years old, and one-fourth are less than 10 years old. Most of the construction in recent years, however, has been at furnace plants. Of the total ovens in existence at merchant plants in 1962, 70 percent were more than 25 years old, and nearly one-half were older than 40 years. Only 19 percent of the furnace-plant ovens were over 25 years of age, and only 13 percent were older than 40 years. Although approximately 40 percent of the ovens constructed in 1962 were merchant-plant ovens, this was the first oven construction at merchant plants since 1959 when 11 ovens were built. Of the 5,035 slot ovens constructed during the past 10 years (1953–62), only 214, or 4 percent of the total, were built at merchant plants.

TABLE 9.—Breeze recovered at coke plants in the United States in 1962, by States

State	Yield per ton of coal[1] (percent)	Produced		Used by producers—						Sold		On hand Dec. 31 (short tons)
		Short tons	Value	In steam plants		In agglomerating plants		For other industrial uses		Short tons	Value	
				Short tons	Value	Short tons	Value	Short tons	Value			
Oven coke:												
Alabama	5.67	322,323	$3,205,284	(2)	(2)	91,867	$1,011,377	30,614	$285,754	167,942	$1,721,474	49,261
California, Colorado, and Utah	7.12	272,711	1,824,817			196,287	1,303,203	26,437	158,790	62,139	443,361	12,389
Connecticut, Maryland, New Jersey, and New York	4.89	456,600	2,725,254	385,097	$2,335,288	(2)	(2)	90,252	515,381	7,921	78,716	44,950
Illinois	5.42	154,323	1,043,775	24,908	160,782	80,981	521,465	12,887	109,072	28,746	210,366	23,299
Indiana	5.66	572,349	3,729,585	42,310	260,159	493,925	3,251,479	47,485	309,227	11,934	73,437	668,465
Kentucky, Missouri, Tennessee, and Texas	5.46	136,717	1,058,988	(2)	(2)	(2)	(2)	(2)	(2)	83,766	717,486	9,247
Michigan	4.41	191,235	1,642,116	(2)	(2)	(2)	(2)	(2)	(2)	50,672	353,049	51,214
Minnesota and Wisconsin	4.83	48,278	339,731	(2)	(2)			(2)	(2)	36,964	279,227	54,414
Ohio	4.15	406,527	2,702,327	66,278	430,876	72,712	418,597	66,035	350,270	168,017	1,325,363	145,641
Pennsylvania	3.24	649,059	4,492,734	139,420	976,580	219,780	1,451,644	254,738	1,940,214	110,210	623,305	219,807
West Virginia	5.54	214,598	1,017,302	(2)	(2)	(2)	(2)	(2)	(2)	44,312	247,718	954
Undistributed				62,453	391,656	315,978	2,061,395	66,549	443,797			
Total 1962	4.67	3,424,720	23,781,913	720,466	4,555,341	1,471,530	10,019,160	594,997	4,112,505	772,623	6,073,502	[3] 1,279,641
At merchant plants	5.61	427,999	3,591,925	143,071	1,082,948			20,927	125,629	228,763	2,178,467	165,691
At furnace plants	4.56	2,996,721	20,189,988	577,395	3,472,393	1,471,530	10,019,160	574,070	3,986,876	543,860	3,895,035	1,113,950
Total 1961	4.59	3,337,164	25,105,829	619,458	4,360,263	1,518,930	12,766,573	506,746	2,676,311	762,871	6,550,092	[3] 1,416,974
Beehive coke:												
Pennsylvania	5.54	14,761	81,180							14,761	81,180	
Kentucky and Virginia	6.18	28,672	137,390							28,972	138,144	300
Total:												
1962	5.95	43,433	218,570							43,733	219,324	300
1961	4.85	53,525	218,212							44,927	158,553	10,990

---

[1] Calculated by dividing production by coal carbonized at plants actually recovering breeze.

[2] Included with "Undistributed" to avoid disclosing individual company data.

[3] Includes some breeze resulting from the screening of coke at blast furnaces.

TABLE 10.—Oven- and beehive-coke breeze used in the United States and sold, by uses

(Short tons)

Year	Used by producers— In steam plants	In agglomerating plants	For other industrial uses	Sold	Average value per ton
1947-49 (average)	3,450,905	[1] 300,000	[2] 489,055	1,142,589	$3.79
1957-59 (average)	1,612,547	796,390	447,171	1,042,308	7.22
1960	1,142,730	1,343,515	479,740	972,240	8.27
1961	619,458	1,518,930	506,746	807,798	8.30
1962	720,466	1,471,530	594,997	816,356	7.71

[1] Estimated.
[2] Includes 77,795 tons used to make producer or water gas.

TABLE 11.—Slot ovens completed and abandoned in the United States in 1962, by States

State	Plants in existence Dec. 31 [1]	Ovens: New	Abandoned during year [2]	In existence Dec. 31	Under construction Dec. 31
Alabama	7	----	----	1,516	----
California	1	----	----	315	----
Colorado	1	----	----	206	----
Connecticut	1	----	----	70	----
Illinois	6	----	----	568	----
Indiana	5	----	----	2,218	----
Kentucky	1	----	----	196	----
Maryland	1	----	----	757	----
Michigan	4	61	87	682	25
Minnesota	2	----	20	180	----
Missouri	1	18	----	58	----
New Jersey	1	----	----	120	----
New York	3	60	49	805	50
Ohio	12	----	593	1,820	----
Pennsylvania	12	----	----	3,720	----
Tennessee	1	----	----	44	----
Texas	2	----	----	140	----
Utah	1	----	56	252	----
West Virginia	3	51	74	668	----
Wisconsin	1	----	----	200	----
Total 1962	66	190	879	14,535	75
At merchant plants	17	78	74	1,894	----
At furnace plants	49	112	805	12,641	75
Total 1961	71	435	531	15,224	179

[1] Excludes plants retired permanently during year.
[2] Includes ovens dismantled for rebuilding.

The number and kind of slot ovens in existence in each State at the end of 1962 are shown in table 13. Nearly one-half of the total were Koppers-Becker underjet ovens, and most of the remainder were of Wilputte and Koppers design.

Beehive Ovens.—Except for 1960 when two new beehive-coke plants were constructed, beehive ovens have steadily declined in number since 1951, and the number of serviceable ovens in existence at the end of 1962 was the lowest on record. Table 14 shows the number of beehive ovens constructed or rebuilt, abandoned, under construction, and in existence in each State at the end of 1962. Although there were 4,979 ovens at 27 plants that could have been

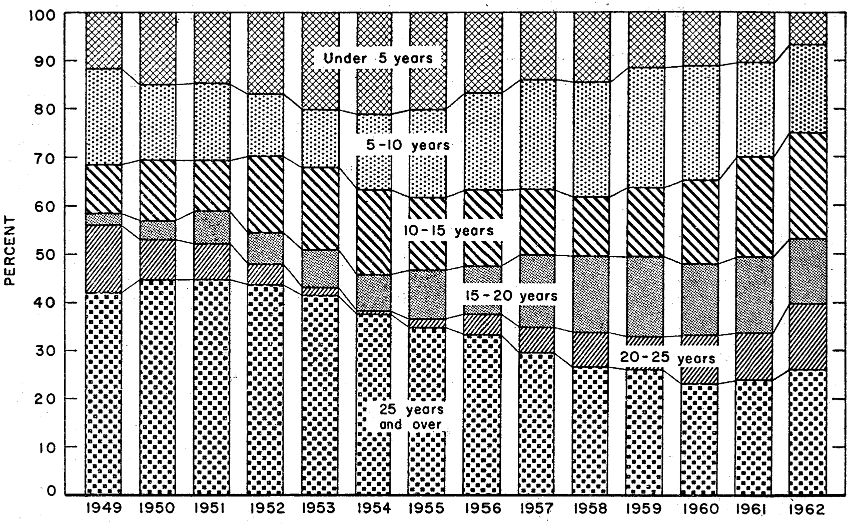


FIGURE 3.—Age of slot ovens in the United States.

TABLE 12.—Age of slot ovens in the United States on Dec. 31, 1962 [1]

Age	At merchant plants		At furnance plants		Total	
	Number of ovens	Percent of total	Number of ovens	Percent of total	Number of ovens	Percent of total
Under 5 years	78	4.1	916	7.3	994	6.8
From 5 to 10 years	24	1.3	2,633	20.8	2,657	18.3
From 10 to 15 years	190	10.0	2,997	23.7	3,187	21.9
From 15 to 20 years	120	6.3	1,825	14.4	1,945	13.4
From 20 to 25 years	151	8.0	1,844	14.6	1,995	13.7
From 25 to 30 years	35	1.9	646	5.1	681	4.7
From 30 to 35 years	114	6.0	41	.3	155	1.1
From 35 to 40 years	298	15.7	110	.9	408	2.8
40 years and over	884	46.7	1,629	12.9	2,513	17.3
Total	1,894	100.0	12,641	100.0	14,535	100.0

[1] Age dates from first entry into operation or from last date of rebuilding.

operated if the demand for beehive coke increased, the average number of ovens operating monthly in 1962 was only 1,761. There was a net loss of 723 ovens during the year as 727 ovens were abandoned and only 4 were new or rebuilt. An additional 210 new ovens, however, were under construction at the end of 1962.

QUANTITY AND VALUE OF COAL CARBONIZED

Seventy-four million tons of bituminous coal and 420,000 tons of anthracite were carbonized in high-temperature coke ovens in 1962. This was a slight increase (480,000 tons) over the total quantity charged in 1961, but was nearly 14 million tons less than the average quantity charged annually in 1957–59. All of the anthracite and 98 percent of the bituminous coal carbonized in 1962 was charged into slot ovens. Anthracite was used as a blend, chiefly by producers of foundry coke. The quantities of anthracite and bituminous coal

TABLE 13.—Number of slot ovens in the United States on Dec. 31, 1962, by States and kinds

State	Koppers	Koppers-Becker	Semet-Solvay	Wilputte	All others	Total
Alabama	510	633	180	130	[1] 63	1,516
California		315				315
Colorado	60	146				206
Connecticut		70				70
Illinois		238		330		568
Indiana	340	1,166	60	652		2,218
Kentucky			120	76		196
Maryland		757				757
Michigan		172	362	148		682
Minnesota	65	115				180
Missouri	18				[2] 40	58
New Jersey	55	65				120
New York	135	186	120	364		805
Ohio	667	516	176	461		1,820
Pennsylvania	961	1,546	88	1,125		3,720
Tennessee			24	20		44
Texas		140				140
Utah		252				252
West Virginia	154	514				668
Wisconsin	100		100			200
Total 1962	3,065	6,831	1,230	3,306	103	14,535
At merchant plants	398	469	624	363	40	1,894
At furnace plants	2,667	6,362	606	2,943	63	12,641
Total 1961	[3] 3,453	[3] 6,862	1,230	3,576	103	15,224

[1] Otto.
[2] Simon-Carves.
[3] Revised figure.

TABLE 14.—Beehive ovens completed and abandoned in the United States in 1962, by States

State	Plants in existence Dec. 31	Ovens			
		New or rebuilt	Abandoned during year	In existence Dec. 31	Under construction Dec. 31
Kentucky	1			200	
Pennsylvania	20		575	3,918	
Virginia	5	4		667	210
West Virginia	1		152	194	
Total:					
1962	27	4	[1] 727	4,979	210
1961	34	153	[1] 2,034	5,702	

[1] Idle and not expected to resume production; removed from list of available ovens.

TABLE 15.—Average number of beehive ovens active in the United States in 1962, by months

Month	Number	Month	Number	Month	Number
January	1,954	May	1,858	September	1,725
February	1,956	June	1,858	October	1,540
March	1,987	July	1,713	November	1,520
April	1,870	August	1,704	December	1,451

coked in slot ovens increased; the amount of coal carbonized in beehive ovens, however, decreased.

Daily consumption of coal in both slot and beehive ovens ranged from an average of 252,000 tons in February to 166,000 tons in July. Average daily consumption for the year was 203,000 tons, compared with 202,000 tons in 1961.

The total value of coal carbonized in 1962 was $730 million, 1 percent more than in 1961. The higher value in 1962 was due to increases in the quantity of coal carbonized and in the average value of the coal received.

Tables 18 and 19 show the quantity and delivered value of coal carbonized at coke plants in various States. The average value of all coal carbonized at oven-coke plants in 1962 was $0.06 more per ton than in 1961. Although the coal delivered to oven-coke plants in several States had higher unit values than in 1961, the increase can be attributed mainly to the coal carbonized in Pennsylvania, which increased $0.49 per ton in average value. Coal costs at oven-coke plants in Pennsylvania increased in 1962 because a larger percentage of the total coal received came from other States, and the value of this coal reflected additional charges for transportation. Such charges were reflected also in the high unit value of coal carbonized in California, Colorado, and Utah, particularly of coal moving to California from Colorado, New Mexico, Utah, and West Virginia, and of the West Virginia and Oklahoma coals shipped to Colorado and Utah. Coke produced at beehive plants had relatively low unit values because these plants are located at or near their source of supply.

TABLE 16.—Bituminous coal carbonized in coke ovens in the United States, by months

(Short tons)

Month	1957-59 (average)			1961			1962		
	Slot	Beehive	Total	Slot	Beehive	Total	Slot	Beehive	Total
January	7,974,200	220,300	8,194,500	4,948,800	103,800	5,052,600	7,463,600	171,700	7,640,300
February	7,312,300	213,300	7,525,600	4,683,900	103,400	4,787,300	6,889,000	158,000	7,047,000
March	8,125,900	251,200	8,377,100	5,223,500	117,800	5,341,300	7,536,100	158,400	7,694,500
April	7,619,800	230,500	7,850,300	5,381,600	109,500	5,491,100	7,063,700	114,100	7,177,800
May	7,833,800	198,000	8,031,800	6,070,200	136,300	6,206,500	6,338,800	96,300	6,435,100
June	7,569,600	180,700	7,750,300	6,018,700	133,200	6,151,900	5,384,600	89,700	5,474,300
July	6,531,200	138,300	6,669,500	6,151,400	123,500	6,274,900	5,063,300	75,100	5,138,400
August	5,892,900	139,900	6,032,800	6,359,300	144,000	6,503,300	5,274,900	84,500	5,359,400
September	5,849,300	132,400	5,981,700	6,498,000	126,600	6,624,600	5,263,200	85,100	5,348,300
October	6,152,600	127,100	6,279,700	6,931,000	137,900	7,068,900	5,472,700	103,600	5,576,300
November	7,116,800	129,300	7,246,100	6,859,700	128,600	6,988,300	5,397,000	107,800	5,504,800
December	7,842,200	144,300	7,986,500	7,258,900	131,500	7,390,400	5,771,400	94,600	5,866,000
Total	85,820,600	2,105,300	87,925,900	72,385,000	1,496,100	73,881,100	72,923,300	1,338,900	74,262,200

PREPARATION AND SOURCE OF COAL

Washed and Unwashed Coals.—Eighty-five percent of the bituminous coal and virtually all anthracite carbonized in 1962 was mechanically cleaned before it was charged into coke ovens. Before World War II, most of the coking coals were of premium quality and, as late as 1948, less than one-third of the total coal received by coke plants was cleaned. Since then, most mines have been completely mechanized and most of the coal currently produced contains too much ash and sulfur to make coke of good quality. These impurities are satisfactorily reduced, however, by mechanical cleaning. Both pneumatic and wet-washing cleaning methods are employed, but the latter method is preferred. Hence, the term "washed" is applied generally to coals that have been cleaned. Virtually all coals were cleaned at the mines and shipped to coke plants ready for use.

TABLE 17.—Anthracite carbonized at oven-coke plants in the United States, by months

(Short tons)

Month	1957-59 (average)	1960	1961	1962
January	29,700	35,800	25,300	35,100
February	28,200	37,700	23,100	32,100
March	29,900	42,200	23,600	34,300
April	29,100	36,100	25,200	34,600
May	30,200	32,900	27,000	31,500
June	26,000	29,700	26,100	30,300
July	24,800	25,900	25,300	30,600
August	25,600	26,200	26,000	34,600
September	26,300	25,500	27,300	35,000
October	29,800	28,500	28,400	39,600
November	29,000	25,700	30,700	38,700
December	29,000	24,100	32,100	43,100
Total	337,600	370,300	320,100	419,500

TABLE 18.—Quantity and value at ovens of coal carbonized in the United States in 1962, by States

State	Coal carbonized			Coal per ton of coke	
	Short tons	Value		Short tons	Value
		Total	Average		
Oven coke:					
Alabama	5,681,936	$47,436,388	$8.35	1.38	$11.54
California, Colorado, and Utah	3,832,609	48,228,034	12.58	1.59	20.04
Connecticut, Maryland, New Jersey, and New York	9,342,484	115,011,660	12.31	1.44	17.70
Illinois	2,845,846	27,481,323	9.66	1.48	14.33
Indiana	10,106,509	113,408,682	11.22	1.44	16.14
Kentucky, Missouri, Tennessee, and Texas	2,502,843	22,699,819	9.07	1.41	12.81
Michigan	4,340,185	43,602,061	10.05	1.37	13.78
Minnesota and Wisconsin	999,234	11,119,849	11.13	1.32	14.69
Ohio	9,791,455	87,498,460	8.94	1.43	12.78
Pennsylvania	20,025,333	176,574,978	8.82	1.43	12.63
West Virginia	3,874,413	29,609,220	7.64	1.48	11.34
Total 1962	73,342,847	722,670,474	9.85	1.44	14.14
At merchant plants	7,630,364	74,128,095	9.71	1.40	13.63
At furnace plants	65,712,483	648,542,379	9.87	1.44	14.20
Total 1961	72,705,165	711,860,867	9.79	1.43	14.00
Beehive coke:					
Pennsylvania	630,270	3,668,529	5.82	1.64	9.53
Kentucky, Virginia, and West Virginia	708,592	3,437,146	4.85	1.66	8.05
Total:					
1962	1,338,862	7,105,675	5.31	1.65	8.75
1961	1,496,106	9,123,054	6.10	1.70	10.36

All bituminous coals carbonized in Michigan, Minnesota, West Virginia, and Wisconsin were washed in 1962, and only relatively small quantities of unwashed coals were coked in most of the other States. The unwashed coals were, primarily, premium-quality Pennsylvania and West Virginia coals, which were consumed principally by coke plants in Maryland, Ohio, and Pennsylvania.

Blending.—To improve oven operations and also produce the required grade and yield of coke at lowest cost, operators of oven-coke plants mix or blend coals with varying properties. Blends vary greatly from plant to plant, but in general the coal mixture depends

TABLE 19.—Average value per short ton of coal carbonized at oven-coke plants in the United States, by States

State	1957-59 (average)	1960	1961	1962
Alabama	$8.13	$8.18	$8.36	$8.35
California, Colorado, and Utah	12.24	12.56	12.92	12.58
Connecticut, Maryland, New Jersey, and New York	[1] 11.87	11.94	12.01	12.31
Illinois	10.65	10.17	9.84	9.66
Indiana	11.23	11.43	11.20	11.22
Kentucky, Missouri, Tennessee, and Texas	10.60	9.93	8.62	9.07
Michigan	10.22	10.08	10.14	10.05
Minnesota and Wisconsin	11.46	11.32	11.07	11.13
Ohio	9.79	9.61	9.11	8.94
Pennsylvania	8.56	8.45	8.33	8.82
West Virginia	7.74	7.75	7.80	7.64
Average	9.90	9.89	9.79	9.85
Value of coal per ton of coke	14.08	14.03	14.00	14.14

[1] Includes Massachusetts.

TABLE 20.—Value of coal and products per short ton of coal carbonized in the United States

Year	Oven coke					Beehive coke	
	Value of coal per ton	Value per ton of coal				Value of coal per ton	Value per ton of coal
		Coke produced	Breeze produced	Coal-chemical materials used or sold [1]	Total		
1957-59 (average)	$9.90	$12.75	$0.31	$3.84	$16.90	$6.12	$8.76
1960	9.89	12.96	.34	3.85	17.15	6.11	8.99
1961	9.79	12.45	.34	3.84	16.63	6.10	8.88
1962	9.85	12.64	.32	3.61	16.57	5.31	9.07

[1] Includes value of surplus gas used and tar and pitch-of-tar burned.

upon the coals economically available and upon the yield and quality of the products desired. The low-volatile coals are highly expanding and cannot be coked successfully alone in slot ovens because they exert pressures against oven walls that make removal of coke from the ovens difficult or impossible. The high-volatile coals, however, contract while coking, and they must be blended with low-volatile coal to obtain a mixture that is neutral or slightly contracting. Most plants use a blend of high- and low-volatile coals, although some plants also use medium-volatile coal or other blending materials such as anthracite or coal-tar pitch. High-volatile coals can be coked alone, but this practice is not preferred because of the weaker coke and relatively low coke yields that result.

Sixty-five percent of coal received by coke plants in 1962 was high volatile; 15 percent was medium volatile; and 20 percent was low volatile. Nineteen plants used blends of high-, medium-, and low-volatile coals; 36 plants used high- and low-volatile coals; 5 plants used a high- and medium-volatile blend; 2 plants used medium- and low-volatile coals; 4 plants used medium-volatile coal exclusively; and 18 used additions of anthracite.

Sources.—Ninety-three percent of the coal received by coke plants in 1962 was produced in the Appalachian region, which includes the States extending south from Pennsylvania to Alabama. The remainder was produced principally in Colorado, Illinois, Utah, and Oklahoma. West Virginia and Pennsylvania were the principal producers, supplying 40 and 29 percent of the total, respectively. The West Virginia shipments were principally medium- and low-volatile coals from the Pocahontas field and high-volatile coals from the Fairmont and Kanawha fields. Shipments also were made, however, from eight other producing fields in West Virginia. The Pennsylvania coals were chiefly high-volatile from the Pittsburgh, Connellsville, and Freeport fields and low-volatile coal from the Central Pennsylvania field. Nearly 1 million tons of Illinois coals was received by coke plants in Illinois and Indiana for blending with high-rank eastern coals shipped principally from Kentucky and West Virginia. Coke plants in California, Colorado, Texas, and Utah operated mainly on western coals produced in Colorado, New Mexico, Oklahoma, and Utah. These States, however, also received some eastern coals for blending. Tables 24 and 25 show the origin and destination of coal delivered to oven-coke plants in 1962.

Captive Coal.—Nearly two-thirds of the coal received by oven-coke plants was obtained from "captive" mines. (The term "captive" designates mines owned and operated by coke or associated companies that produce coal primarily for use in their coke ovens.) Most captive mines are owned by iron and steel companies, and 92 percent of 45 million tons of captive coal was received by furnace plants.

TABLE 21.—Washed and unwashed coal carbonized in the United States in 1962, by States in which used

(Short tons)

State	Bituminous coal			Anthracite	Grand total
	Washed	Unwashed	Total		
Oven coke:					
Alabama	5,617,479	24,445	5,641,924	40,012	5,681,936
California, Colorado, and Utah	3,451,836	380,773	3,832,609	----------	3,832,609
Connecticut, Maryland, New Jersey, and New York	4,579,089	4,733,086	9,312,175	30,309	9,342,484
Illinois	2,547,139	288,375	2,835,514	10,332	2,845,846
Indiana	9,461,660	583,553	10,045,213	61,296	10,106,509
Kentucky, Missouri, Tennessee, and Texas	2,110,886	361,052	2,471,938	30,905	2,502,843
Michigan	4,260,390	----------	4,260,390	79,795	4,340,185
Minnesota and Wisconsin	947,251	----------	947,251	51,983	999,234
Ohio	8,685,900	1,046,145	9,732,045	59,410	9,791,455
Pennsylvania	16,490,623	3,479,232	19,969,855	55,478	20,025,333
West Virginia	3,874,413	----------	3,874,413	----------	3,874,413
Total 1962	62,026,666	10,896,661	72,923,327	419,520	73,342,847
At merchant plants	7,007,403	284,578	7,291,981	338,383	7,630,364
At furnace plants	55,019,263	10,612,083	65,631,346	81,137	65,712,483
Total 1961	61,700,024	10,685,016	72,385,040	320,125	72,705,165
Beehive coke:					
Pennsylvania	540,186	90,084	630,270	----------	630,270
Kentucky, Virginia, and West Virginia	584,623	123,969	708,592	----------	708,592
Total:					
1962	1,124,809	214,053	1,338,862	----------	1,338,862
1961	1,184,232	311,874	1,496,106	----------	1,496,106

Furnace plants, however, received an additional 24 million tons of coal from commercial mines. Table 26 shows the coal received by oven-coke plants from captive mines in 1962.

TABLE 22.—Washed and unwashed bituminous coal carbonized in the United States

(Short tons)

Year	Washed coal			Unwashed coal			Total coal carbonized	Percent of total washed
	At slot ovens	At beehive ovens	Total	At slot ovens	At beehive ovens	Total		
1957–59 (average)	66, 219, 149	1, 429, 859	67, 649, 008	19, 601, 434	675, 484	20, 276, 918	87, 925, 926	76. 9
1960	66, 709, 730	1. 208, 781	67, 918, 511	12, 663, 537	432, 629	13, 096, 166	81, 014, 677	83. 8
1961	61, 700, 024	1, 184, 232	62, 884, 256	10, 685, 016	311, 874	10, 996, 890	73, 881, 146	85. 1
1962	62, 026, 666	1, 124, 809	63, 151, 475	10, 896, 661	214, 053	11, 110, 714	74, 262, 189	85. 0

TABLE 23.—Coal received by oven-coke plants in the United States in 1962, by consuming States and volatile content[1]

(Short tons)

Consuming State	High-volatile		Medium-volatile		Low-volatile		Total coal receipts
	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	
Alabama	321, 367	5. 2	5, 328, 262	87. 2	463, 669	7. 6	6, 113, 298
California, Colorado, and Utah	3, 146, 221	78. 8	689, 112	17. 3	154, 082	3. 9	3, 989, 415
Connecticut, Maryland, New Jersey, and New York	6, 393, 349	68. 7	364, 944	3. 9	2, 546, 692	27. 4	9, 304, 985
Illinois	2, 154, 940	75. 2	36, 780	1. 3	672, 627	23. 5	2, 864, 347
Indiana	5, 641, 259	57. 9	1, 571, 633	16. 1	2, 533, 828	26. 0	9, 746, 720
Kentucky, Missouri, Tennessee, and Texas	1, 642, 663	66. 6	379, 300	15. 4	445, 175	18. 0	2, 467, 138
Michigan	2, 753, 433	64. 4	439, 692	10. 3	1, 081, 707	25. 3	4, 274, 832
Minnesota and Wisconsin	447, 866	49. 1	94, 066	10. 3	370, 604	40. 6	912, 536
Ohio	7, 273, 937	75. 7	170, 158	1. 8	2, 158, 922	22. 5	9, 603, 017
Pennsylvania	13, 997, 322	71. 0	1, 963, 697	9. 9	3, 762, 772	19. 1	19, 723, 791
West Virginia	3, 166, 127	84. 4	----------	------	583, 689	15. 6	3, 749, 816
Total 1962	46, 938, 484	64. 5	11, 037, 644	15. 2	14, 773, 767	20. 3	72, 749, 895
At merchant plants	3, 550, 095	48. 4	1, 162, 450	15. 8	2, 625, 119	35. 8	7, 337, 664
At furnace plants	43, 388, 389	66. 3	9, 875, 194	15. 1	12, 148, 648	18. 6	65, 412, 231
Total 1961	48, 107, 725	64. 8	10, 686, 578	14. 4	15, 481, 302	20. 8	74, 275, 605

[1] Volatile matter on moisture-free basis: High-volatile—over 31 percent; medium-volatile—22 to 31 percent; and low-volatile—14 to 22 percent.

CONSUMPTION OF COKE

The apparent consumption of coke in the United States for 1962 and several previous years, based upon production, imports, exports, and changes in producers' stocks, is shown in table 28. Consumption in 1962 was only slightly less than in 1961, but was 15 percent below the average consumption in 1957–59 and 26 percent lower than that of 1947–49. When related to quantities, 1962 annual consumption declined approximately 9 million tons from 1957–59 and 18 million tons from 1947–49.

Two factors—the substitution of other fuels for coke and lower blast-furnace coke rates—were largely responsible for the decline. In

TABLE 24.—Origin of coal received by oven-coke plants in the United States in 1962, by producing fields and volatile content

(Short tons)

State and field [1] where coal was produced	Volatile content [2]			Total
	High	Medium	Low	
Alabama	321,367	5,431,405	------------	5,752,772
Colorado	1,008,541	417,375	------------	1,425,916
Illinois	940,971	------------	------------	940,971
Kentucky:				
Elkhorn	5,534,964	------------	------------	5,534,964
Harlan	2,696,075	------------	------------	2,696,075
New Mexico	245,926	------------	------------	245,926
Oklahoma	399,681	357,673	4,861	762,215
Pennsylvania:				
Anthracite	------------	------------	430,525	430,525
Bituminous:				
Central Pennsylvania	------------	264,511	1,806,954	2,071,465
Connellsville	4,378,068	------------	------------	4,378,068
Freeport	2,707,017	------------	------------	2,707,017
Pittsburgh	10,949,559	------------	------------	10,949,559
Somerset	------------	------------	199,835	199,835
Westmoreland	203,605	------------	------------	203,605
Tennessee	------------	13,600	------------	13,600
Utah	1,875,065	------------	------------	1,875,065
Virginia:				
Buchanan	84,430	699,013	------------	783,443
Clinch Valley	------------	328,710	------------	328,710
Pocahontas	------------	5,733	185,858	191,591
Southwestern	1,183,628	686,905	------------	1,870,533
West Virginia:				
Coal River	381,890	------------	------------	381,890
Fairmont	5,010,275	------------	------------	5,010,275
Kanawha	4,698,963	------------	------------	4,698,963
Kenova-Thacker	1,189,231	------------	------------	1,189,231
Logan	2,796,553	104,454	------------	2,901,007
New River	------------	------------	484,238	484,238
Pocahontas	------------	1,462,903	10,053,187	11,516,090
Randolph-Barbour	------------	920	------------	920
Tug River	------------	------------	36,131	36,131
Webster-Gauley	332,675	972,517	------------	1,305,192
Winding Gulf	------------	291,925	1,572,178	1,864,103
Total	46,938,484	11,037,644	14,773,767	72,749,895

[1] As defined by the U.S. Coal Commission of 1922.

[2] Volatile matter on moisture-free basis: High-volatile—over 31 percent; medium-volatile—22 to 31 percent; and low-volatile—14 to 22 percent.

1947–49, approximately 14 million tons of coke was used annually for purposes other than blast-furnace fuel. Of this quantity, 4.6 million tons was used for manufacturing producer and water gas, and 3.4 million tons was sold for residential heating. During the next decade, however, these markets were greatly reduced by the inroads made by fuel oil and natural gas, and by 1957–59, annual consumption of coke for both purposes had declined to 1.1 million tons. In the ensuing years, these markets continued to decline, and in 1962, only 83,000 tons of coke was consumed by producer- and water-gas plants, and less than 500,000 tons was used for residential heating.

The general decline in blast-furnace coke rates began in 1953, and in the past decade, the amount of coke required to produce each ton of pig iron and ferroalloys has decreased by about 25 percent. Expressed in weight units, this was a reduction of 470 pounds of coke for each ton of pig iron and ferroalloys produced. The average coke rate for 1957–59 was 285 pounds lower than the rate in 1947–49, and although average annual pig iron and ferroalloys production was 13 percent higher in 1957–59, coke consumption by blast furnaces decreased nearly 2

TABLE 25.—Origin of coal received by oven-coke plants in the United States in 1962, by States

(Short tons)

Consuming State	Coal produced in—						
	Alabama	Arkansas	Colorado	Illinois	Kentucky	New Mexico	Oklahoma
Alabama	5,600,746	----------	----------	----------	----------	----------	----------
California, Colorado, and Utah	----------	----------	1,425,916	15,635	----------	245,926	148,706
Connecticut, Maryland, New Jersey, and New York	----------	----------	----------	----------	1,092,688	----------	----------
Illinois	----------	----------	----------	783,347	1,143,868	----------	----------
Indiana	----------	----------	----------	141,989	3,486,807	----------	----------
Kentucky, Missouri, Tennessee, and Texas	152,026	----------	----------	----------	----------	----------	613,509
Michigan	----------	----------	----------	----------	1,141,823	----------	----------
Minnesota and Wisconsin	----------	----------	----------	----------	95,121	----------	----------
Ohio	----------	----------	----------	----------	514,577	----------	----------
Pennsylvania	----------	----------	----------	----------	756,155	----------	----------
West Virginia	----------	----------	----------	----------	----------	----------	----------
Total 1962	5,752,772	----------	1,425,916	940,971	8,231,039	245,926	762,215
At merchant plants	543,519	----------	----------	----------	42,304	----------	----------
At furnace plants	5,209,253	----------	1,425,916	940,971	8,188,735	245,926	762,215
Total 1961	5,465,270	92,415	1,702,194	724,759	9,284,178	350,018	696,676

Consuming State	Coal produced in—					Total
	Pennsylvania	Tennessee	Utah	Virginia	West Virginia	
Alabama	40,318	13,600	----------	----------	458,634	6,113,298
California, Colorado, and Utah	----------	----------	1,875,065	----------	278,167	3,989,415
Connecticut, Maryland, New Jersey, and New York	3,005,985	----------	----------	337,855	4,868,457	9,304,985
Illinois	19,871	----------	----------	49,387	867,874	2,864,347
Indiana	63,073	----------	----------	729,036	5,325,815	9,746,720
Kentucky, Missouri, Tennessee, and Texas	40,929	----------	----------	230,343	1,430,331	2,467,138
Michigan	255,789	----------	----------	235,090	2,642,130	4,274,832
Minnesota and Wisconsin	48,440	----------	----------	5,953	763,022	912,536
Ohio	3,763,065	----------	----------	559,145	4,766,230	9,603,017
Pennsylvania	10,715,609	----------	----------	1,027,468	7,224,559	19,723,791
West Virginia	2,986,995	----------	----------	----------	762,821	3,749,816
Total 1962	20,940,074	13,600	1,875,065	3,174,277	29,388,040	72,749,895
At merchant plants	346,411	----------	----------	426,520	5,978,910	7,337,664
At furnace plants	20,593,663	13,600	1,875,065	2,747,757	23,409,130	65,412,231
Total 1961	20,853,562	220,326	2,633,011	3,275,231	28,977,965	74,275,605

million tons. The coke rate continued to decrease in subsequent years, and in 1962, approximately the same quantitity of pig iron and ferroalloys was produced as in 1957–59 but with about 8 million tons less coke.

Tables 30 and 31 show the disposal of oven and beehive coke in 1962. The major part of the oven-coke production was used by producers in blast-furnace operations. A total of 51.2 million tons of oven coke was used and sold in 1962, of which furnace plants consumed 44.4 million tons, or about seven-eighths of the total, in blast furnaces and 259,000 tons for other purposes in integrated or affiliated plants. Nearly 1 million tons was sold for use in blast furnaces, foundries, and other industrial plants and furnished several thousand tons of coke for

TABLE 26.—Quantity and percentage of captive coal received by oven-coke plants in the United States

(Short tons)

Year	At merchant plants			At furnace plants			Total		
	Total coal received	Captive coal		Total coal received	Captive coal		Total coal received	Captive coal	
		Quantity	Percent		Quantity	Percent		Quantity	Percent
1957-59 (average)	10, 270, 085	4, 523, 385	44. 0	76, 660, 207	48, 941, 264	63. 8	86, 930, 292	53, 464, 649	61. 5
1960	8, 726, 368	3, 834, 264	43. 9	71, 353, 799	45, 091, 010	63. 2	80, 080, 167	48, 925, 274	61. 1
1961	7, 727, 607	3, 214, 284	41. 6	66, 547, 998	42, 354, 003	63. 6	74, 275, 605	45, 568, 287	61. 4
1962	7, 337, 664	3, 361, 357	45. 8	65, 412, 231	41, 377, 978	63. 3	72, 749, 895	44, 739, 335	61. 5

TABLE 27.—Average volatile content of bituminous coal carbonized by oven-coke plants in the United States

Year	High		Medium		Low		Total	
	Short tons	Volatile content (percent)	Short tons	Volatile content (percent)	Short tons	Volatile content (percent)	Short tons	Volatile content (percent)
1957-59 (average)	56, 499, 763	34. 9	11, 447, 103	26. 0	17, 873, 717	17. 7	85, 820, 583	30. 1
1960	52, 065, 009	35. 5	11, 113, 548	25. 8	16, 194, 710	17. 5	79, 373, 267	30. 4
1961	47, 304, 877	35. 6	10, 175, 333	25. 9	14, 904, 830	17. 6	72, 385, 040	30. 5
1962	47, 846, 051	35. 3	10, 469, 256	26. 1	14, 608, 020	17. 6	72, 923, 327	30. 4

residential heating. Merchant plants sold 5.3 million tons of coke, chiefly to blast furnaces, foundries, and other industrial plants, and consumed 400,000 tons of output in their own or affiliated operations.

Beehive coke was produced chiefly in plants not affiliated with steel mills and most of the coke was sold on the open market. Roughly the same quantity of beehive coke was distributed in 1962 as in 1961, and the disposal pattern remained about the same. Markets for beehive coke have changed somewhat in recent years, however, and beehive plants currently sell the smaller portion of their output to blast-furnace plants, whereas about a decade ago, most of the beehive coke produced was consumed in blast furnaces. Of the 815,000 tons of beehive coke distributed in 1962, only about one-third was sold to blast furnaces, and the remainder was sold chiefly to other industrial plants.

TABLE 28.—Apparent consumption of coke in the United States

(Short tons)

Year	Total production	Imports	Exports	Net change in stocks	Apparent U.S. consumption [1]	Consumption			
						In iron furnaces [2]		All other purposes	
						Quantity	Percent	Quantity	Percent
1937–39 (average)	43,065,975	187,838	534,393	+290,011	42,429,409	28,009,630	66.0	14,419,779	34.0
1947–49 (average)	70,648,402	181,000	696,699	+280,230	69,852,473	55,877,463	80.0	13,975,010	20.0
1957–59 (average)	61,806,132	120,908	558,428	+782,665	60,585,947	54,140,391	89.4	6.445,556	10.6
1960	57,228,718	126,345	353,016	+55,652	56,946,395	51,044,206	89.6	5,902,189	10.4
1961	51,711,187	126,518	445,232	−696,215	52,088,688	46,771,105	89.8	5,317,583	10.2
1962	51,910,292	141,883	394,296	−135,062	51,792,941	46,244,675	89.3	5,548,266	10.7

[1] Production plus imports minus exports, plus or minus net change in stocks.
[2] American Iron and Steel Institute; figures include coke consumed in manufacturing ferroalloys.

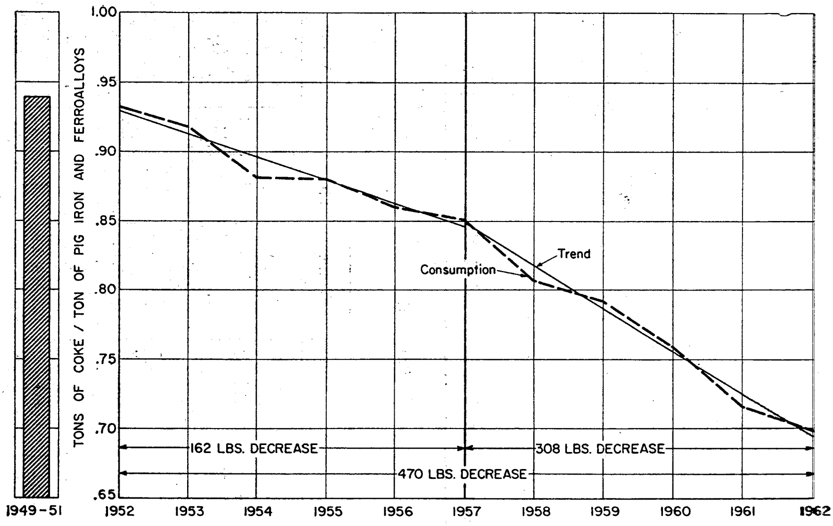


FIGURE 4.—Coke consumption per short ton of pig iron and ferroalloys produced in blast furnaces in the United States.

TABLE 29.—Coke and coking coal consumed per short ton of pig iron and ferroalloys produced in the United States

Year	Coke per short ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per short ton of pig iron and ferroalloys (pounds, calculated)	Year	Coke per short ton of pig iron and ferroalloys [1] (pounds)	Yield of coke from coal (percent)	Coking coal per short ton of pig iron and ferroalloys (pounds, calculated)
1913	2,172.6	66.9	3,247.5	1957–59 (average)	1,634.4	70.0	2,334.9
1918	2,120.7	66.4	3,193.8	1960	1,516.4	70.3	2,157.0
1929	1,838.0	69.0	2,663.8	1961	1,432.6	69.7	2,055.4
1939	1,778.0	69.8	2,547.3	1962	1,395.2	69.5	2,007.5
1949	1,895.8	69.6	2,723.9				

[1] American Iron and Steel Institute; consumption per ton of pig iron only, excluding furnaces making ferroalloys, was 2,172.6 pounds in 1913, 2,120.7 in 1918, 1,813.3 in 1929, 1,760.0 in 1939, 1,870.4 in 1949, 1,617.0 in 1957–59 (average), 1,497.4 in 1960, 1,415.0 in 1961, and 1,379.0 in 1962.

TABLE 30.—Oven coke produced in the United States, used by producers, and sold in 1962, by States

State	Produced		Used by producing companies—				Commercial sales—	
			In blast furnaces		For other purposes [1]		To blast-furnace plants	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Alabama	4,109,628	$83,868,538	3,250,809	$62,554,854	123,683	$3,445,936	(2)	(2)
California, Colorado, and Utah	2,406,276	58,725,006	2,388,127	58,235,857	7,371	153,762		
Connecticut, Maryland, New Jersey, and New York	6,499,514	116,754,315	5,339,682	94,189,128	73,387	1,303,066	491,757	$8,516,492
Illinois	1,917,391	36,357,236	1,811,153	33,373,788	77,770	2,579,968		
Indiana	7,027,014	137,933,130	6,809,427	130,567,187	12,486	239,324	(2)	(2)
Kentucky, Missouri, Tennessee, and Texas	1,772,084	32,961,929	620,939	11,939,172	9,198	245,757	(2)	(2)
Michigan	3,164,917	56,759,076	(2)	(2)	197,597	3,992,407	(2)	(2)
Minnesota and Wisconsin	757,032	17,425,514	(2)	(2)	(2)	(2)		
Ohio	6,848,812	113,492,113	5,713,550	91,175,650	130,270	2,783,659	(2)	(2)
Pennsylvania	13,985,742	228,866,091	13,182,448	213,988,018	23,928	403,373	295,453	4,951,051
West Virginia	2,610,010	43,921,620	2,546,204	43,087,131	(2)	(2)	(2)	(2)
Undistributed			2,687,931	43,116,891	3,248	51,066	1,487,569	22,890,395
Total 1962	51,098,420	927,064,568	44,350,270	782,227,676	658,938	15,198,318	2,274,779	36,357,938
At merchant plants	5,438,368	118,590,948			400,011	8,616,255	1,973,824	31,284,176
At furnace plants	45,660,052	808,473,620	44,350,270	782,227,676	258,927	6,582,063	300,955	5,073,762
Total 1961	50,830,409	904,933,173	44,895,533	775,529,267	706,750	15,850,742	2,342,765	37,442,717

	Commercial sales—Continued							
	To foundries		To other industrial plants[3]		For residential heating		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Alabama	462, 988	$13, 332, 656	130, 788	$2, 140, 046	(2)	(2)	727, 027	$17, 586, 189
California, Colorado, and Utah	(2)	(2)	(2)	(2)	----------	----------	23, 530	584, 151
Connecticut, Maryland, New Jersey, and New York	249, 092	7, 496, 214	211, 014	3, 734, 051	214, 473	$3, 618, 247	1, 166, 336	23, 365, 004
Illinois	----------	----------	11, 072	144, 605	2, 710	42, 469	13, 782	187, 074
Indiana	(2)	(2)	102, 651	1, 857, 395	20, 326	295, 447	503, 668	12, 726, 264
Kentucky, Missouri, Tennessee, and Texas	(2)	(2)	44, 340	777, 562	(2)	(2)	1, 008, 562	18, 028, 294
Michigan	(2)	(2)	210, 494	3, 463, 518	(2)	(2)	630, 771	15, 135, 822
Minnesota and Wisconsin	(2)	(2)	77, 262	1, 489, 623	(2)	(2)	409, 293	11, 629, 863
Ohio	281, 045	8, 430, 892	203, 250	3, 023, 223	(2)	(2)	892, 624	17, 779, 735
Pennsylvania	180, 674	5, 504, 763	140, 211	1, 819, 407	167, 144	1, 687, 377	783, 482	13, 962, 598
West Virginia	----------	----------	(2)	(2)	(2)	(2)	57, 425	736, 622
Undistributed	1, 122, 366	34, 705, 185	55, 375	970, 478	54, 446	830, 520	----------	----------
Total 1962	2, 296, 165	69, 469, 710	1, 186, 457	19, 419, 908	459, 099	6, 474, 060	6, 216, 500	131, 721, 616
At merchant plants	2, 063, 282	62, 465, 206	778, 939	13, 988, 472	453, 565	6, 385, 104	5, 269, 610	114, 122, 958
At furnace plants	232, 883	7, 004, 504	407, 518	5, 431, 436	5, 534	88, 956	946, 890	17, 598, 658
Total 1961	2, 086, 797	62, 752, 266	1, 176, 504	19, 615, 377	324, 879	5, 562, 899	5, 930, 945	125, 373, 259

[1] Comprises 226,630 tons valued at $7,065,550 used in foundries; 52,960 tons valued at $996,969 to make producer and water gas; and 379,348 tons valued at $7,135,799 for other purposes.

[2] Included with "Undistributed" to avoid disclosing individual company data.

[3] Includes 30,164 tons valued at $568,243 to water-gas plants.

TABLE 31.—Beehive coke produced in the United States, used by producers, and sold in 1962, by States

State	Produced		Used by producing companies—				Commercial sales—	
			In blast furnaces		For other purposes		To blast-furnace plants	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Pennsylvania	384,839	$5,261,371	(1)	(1)	(2)	(2)	248,617	$3,651,930
Kentucky, Virginia, and West Virginia	427,033	6,885,259	--------	--------	--------	--------	20,369	330,101
Total:								
1962	811,872	12,146,630	(1)	(1)	(2)	(2)	268,986	3,982,031
1961	880,778	13,285,323	(1)	(1)	(2)	(2)	349,806	5,349,244

State	Commercial sales—Continued							
	To foundries		To other industrial plants		For residential heating		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Pennsylvania	(1)	(1)	137,931	$1,630,046	(2)	(2)	386,628	$5,283,252
Kentucky, Virginia, and West Virginia	(1)	(1)	400,470	6,470,423	(2)	(2)	428,310	6,906,074
Total:								
1962	7,551	$106,826	538,401	8,100,469	(2)	(2)	814,938	12,189,326
1961	(1)	(1)	526,998	7,876,148	(2)	(2)	876,804	13,225,392

[1] Combined with coke sold to blast-furnace plants to avoid disclosing individual company data.
[2] Combined with coke sold to other industrial plants to avoid disclosing individual company data.

DISTRIBUTION OF OVEN AND BEEHIVE COKE

The quantities of coke, excluding imports, distributed in each State, by major end use, and the amount of breeze consumed in each State in 1962 are shown in table 32. Total exports by end use, as reported by producers, are shown also. Because some coke is added or withdrawn from stocks, the quantities of coke and breeze actually consumed may vary with the amounts distributed. In most instances, however, the differences are small and, in this chapter, the terms "distribution" and "consumption" are used synonymously.

The distribution pattern in 1962 remained virtually unchanged from 1961, and 91 percent of the coke distributed was received by blast-furnace plants in 17 States. Three States—Pennsylvania, Ohio, and Indiana—consumed more than one-half of the blast-furnace coke. Blast furnaces in Alabama, Illinois, Maryland, and Michigan also used substantial quantities, and the coke consumed by blast furnaces in these States, plus that distributed to Pennsylvania, Ohio, and Indiana, was about four-fifths of the total consumed by all blast-furnace plants.

Iron foundries ranked next to blast furnaces in coke usage, consuming 5 percent of the large coke distributed in 1962. Unlike blast-furnace coke, which was consumed chiefly within the State where it was produced, foundry coke was distributed in 45 States. Many States receive only minor quantities, however; only eight States received shipments in excess of 100,000 tons. The principal consumers were Michigan, Ohio, Illinois, and Alabama, which together received over one-half of the total foundry coke distributed.

Coke classified as "other industrial" was used in 43 States. Shipments in this category were 4 percent of the total and consisted of coke received by industrial plants other than blast furnaces, foundries, and gas plants. Other industrial coke was used for various industrial processes, including the manufacture of calcium carbide and rock wool, lime burning for soda ash, the reduction of ferroalloys, and nonferrous smelting. Consumption of coke by other industrial plants was slightly higher than in 1961.

Less than 1 percent of the total distributed was sold for manufacturing producer and water gas and for residential heating. Only four States had active producer- or water-gas plants, and total coke sales for gas manufacture were less than 100,000 tons. Coke for residential heating was sold in 28 States and exported to Canada. Total sales, however, were less than 500,000 tons.

Approximately 1 percent of the coke distributed by producers was exported. About 50 percent was shipped to Canada where it was used chiefly by other industrial plants, foundries, and blast furnaces. Most of the remainder was exported to Europe where it was used principally for residential heating.

The market for coke breeze remained firm in 1962, and 3.6 million tons was distributed in 39 States and exported to Canada, Mexico, and Asia. The major part of the production was used by producers for sintering and steam raising, however, and the major consumers were the large coke-producing States.

STOCKS OF COKE AND COKING COAL

Coke.—Stocks of coke at oven and beehive plants at the end of 1962 totaled 3.9 million tons, roughly 30 days' output at the December 1962 production rate. This was a slight decrease (3 percent) from the total on hand December 31, 1961, but stocks have steadily decreased during the past few years and at the end of 1962 were 18 percent lower than in 1960. Production kept pace with demand during 1962, however, and only 135,000 tons of coke was withdrawn from stocks.

Tables 33 and 34 show stocks of coke at merchant and furnace plants and the grades of oven and beehive coke on hand in various States. Virtually all stocks were maintained at oven-coke plants, and 83 percent of the total was blast-furnace-grade coke, stocked chiefly at furnace plants. Furnace plants, however, had nominal stocks of foundry and other grades of coke. Merchant plants had nearly 1 million tons of coke on hand at the end of the year, of which 40 percent was blast-furnace coke, 16 percent was foundry coke, and 44 percent was residential-heating coke and other grades.

Breeze stocks were reduced 10 percent during 1962, but 1.3 million tons was on hand at the end of the year. More than one-half of the breeze stocks were at furnace plants in Indiana, which also had the largest stocks of coke.

Coking Coal.—Stocks of bituminous coal at oven-coke plants decreased 20 percent during 1962 and at the end of the year totaled

TABLE 32.—Distribution of oven and beehive coke and breeze in 1962 [1]

(Short tons)

Consuming State	Coke—						Breeze
	To blast-furnace plants	To foundries	To producer- and water-gas plants	To other industrial plants	For residential heating	Total	
Alabama	3,257,515	172,166	----------	54,939	12,096	3,496,716	210,055
Arizona	----------	1,280	----------	----------	----------	1,280	----------
Arkansas	----------	863	----------	2,767	----------	3,630	89
California	973,887	54,457	----------	42,900	----------	1,071,244	136,508
Colorado	520,045	13,911	----------	21,359	----------	555,315	65,410
Connecticut	----------	25,763	61,555	2,415	19,435	109,168	46,140
Delaware	----------	----------	----------	152	----------	152	----------
Florida	----------	3,314	----------	35,298	242	38,854	43,155
Georgia	----------	11,199	----------	1,853	4,107	17,159	812
Idaho	----------	207	----------	75,045	----------	75,252	5,113
Illinois	3,567,600	214,790	----------	88,028	8,938	3,879,356	170,841
Indiana	5,726,719	130,873	98	73,799	13,948	5,945,437	588,279
Iowa	----------	65,578	----------	2,100	611	68,289	104
Kansas	----------	10,090	----------	26	----------	10,116	249
Kentucky	452,597	36,942	----------	213,264	6,940	709,743	50,957
Louisiana	----------	1,896	----------	55,732	116	57,744	1,433
Maine	----------	819	21,218	----------	----------	22,037	----------
Maryland	3,144,090	21,170	----------	9,518	----------	3,174,778	193,611
Massachusetts	----------	35,877	----------	977	56,205	93,059	2
Michigan	3,211,179	574,949	----------	239,972	6,242	4,032,342	169,417
Minnesota	335,610	20,738	----------	23,127	2,022	381,497	24,952
Mississippi	----------	861	----------	----------	----------	861	27
Missouri	----------	24,022	----------	26,299	120	50,441	3,439
Montana	----------	1,940	----------	18,222	230	20,392	17,524
Nebraska	----------	3,126	----------	8,487	----------	11,613	327
Nevada	----------	73	----------	----------	----------	73	----------
New Hampshire	----------	2,256	----------	----------	----------	2,256	----------
New Jersey	----------	76,642	----------	69,752	69,436	215,830	50,348
New Mexico	----------	----------	----------	41	128	169	35
New York	2,714,514	105,013	----------	128,739	19,270	2,967,536	257,633
North Carolina	----------	21,491	----------	16,156	1,376	39,023	18,345
North Dakota	----------	182	----------	66	----------	248	114
Ohio	7,910,461	313,642	----------	225,795	4,680	8,454,578	346,514
Oklahoma	----------	3,738	----------	2,072	----------	5,810	8,753
Oregon	----------	4,176	----------	13,838	----------	18,014	2,580
Pennsylvania	12,190,261	143,761	253	250,909	18,334	12,603,518	696,965
Rhode Island	----------	10,717	----------	318	----------	11,035	----------
South Carolina	----------	10,418	----------	10,394	420	21,232	12,675
South Dakota	----------	578	----------	602	24	1,204	----------
Tennessee	109,736	76,722	----------	68,364	2,174	256,996	124,064
Texas	557,441	61,186	----------	31,033	1,258	650,918	67,849
Utah	894,195	17,120	----------	21,899	----------	933,214	83,876
Vermont	----------	2,810	----------	7	625	3,442	----------
Virginia	32,885	44,766	----------	31,731	73	109,455	587
Washington	----------	3,114	----------	5,528	----------	8,642	----------
West Virginia	1,265,181	6,177	----------	41,098	16	1,312,472	195,761
Wisconsin	----------	126,001	----------	4,800	11,060	141,861	2,707
Wyoming	----------	----------	----------	3,542	----------	3,542	217
Total	46,863,916	2,457,414	83,124	1,922,963	260,126	51,587,543	3,597,467
Exported	30,119	72,932	----------	151,079	198,973	453,103	5,882
Grand total	46,894,035	2,530,346	83,124	2,074,042	459,099	52,040,646	3,603,349

---

[1] Based upon reports from producers showing destination and principal end use of coke used and sold. Does not include imported coke, which totaled 141,883 tons in 1962.

8.3 million tons. Because coking operations are continuous, it is imperative that coal is available as needed, and most plants maintain at least a 30-day supply at all times. Although yearend stocks have decreased steadily since 1957, coal requirements have also decreased, and the supply on hand for all plants as of December 31, 1962, was equivalent to 45 days' supply at the prevailing consumption rate. Month-end stocks of bituminous coal at oven-coke plants, 1959–62, are shown in table 35. Stocks ranged during the year from a month-end high of 10.4 million tons (58 days' supply) in June to a low of 8.2

million tons (47 days' supply) in September. Stocks normally are increased in June to care for coal requirements during the 2-week miners' vacation period in July when bituminous coal production is suspended.

Month-end stocks of anthracite at oven-coke plants, 1959–62, are shown in table 36. Anthracite stocks are small when compared with stocks of bituminous coal, but only relatively small quantities of anthracite are carbonized. The amount on hand at the end of 1962 was sufficient for 83 days' supply at the December consumption rate.

TABLE 33.—Producers' month-end stocks of oven coke in the United States

(Short tons)

Month	At merchant plants		At furnace plants		Total	
	1961	1962	1961	1962	1961	1962
January	1, 337, 584	1, 180, 978	3, 463, 118	2, 679, 384	4, 800, 702	3, 860, 362
February	1, 379, 696	1, 146, 966	3, 401, 315	2, 614, 123	4, 781, 011	3, 761, 089
March	1, 411, 536	1, 136, 362	3, 285, 272	2, 500, 942	4, 696, 808	3, 637, 304
April	1, 470, 229	1, 144, 066	3, 255, 884	2, 506, 864	4, 726, 113	3, 650, 930
May	1, 477, 644	1, 150, 499	3, 094, 246	2, 624, 386	4, 571, 890	3, 774, 885
June	1, 429, 531	1, 134, 772	2, 927, 995	2, 700, 008	4, 357, 526	3, 834, 780
July	1, 469, 756	1, 140, 736	2, 883, 777	2, 837, 601	4, 353, 533	3, 978, 337
August	1, 410, 627	1, 093, 800	2, 890, 850	2, 971, 251	4, 301, 477	4, 065, 051
September	1, 329, 121	1, 079, 400	2, 771, 993	3, 094, 416	4, 101, 114	4, 173, 816
October	1, 270, 520	1, 047, 404	2, 764, 154	3, 083, 879	4, 034, 674	4, 131, 283
November	1, 227, 906	994, 500	2, 795, 792	3, 024, 258	4, 023, 698	4, 018, 758
December	1, 211, 907	980, 654	2, 820, 299	2, 919, 936	4, 032, 206	3, 900, 590

TABLE 34.—Producers' stocks of coke and breeze in the United States on Dec. 31, 1962, by States

(Short tons)

State	Coke				Breeze
	Blast furnace	Foundry	Residential heating and other	Total	
Oven coke:					
Alabama	648, 974	10, 439	75, 539	734, 952	49, 261
California, Colorado, and Utah	291, 974	----------	----------	291, 974	12, 389
Connecticut, Maryland, New Jersey, and New York	454, 460	60, 141	176, 550	691, 151	44, 950
Illinois	57, 369	----------	4, 915	62, 284	23, 299
Indiana	724, 744	13, 756	22, 509	761, 009	668, 465
Kentucky, Missouri, Tennessee, and Texas	154, 473	24, 317	10, 560	189, 350	9, 247
Michigan	27, 807	1, 767	24, 603	54, 177	51, 214
Minnesota and Wisconsin	77, 024	45, 088	78, 010	200, 122	54, 414
Ohio	325, 849	14, 724	37, 818	378, 391	145, 641
Pennsylvania	450, 651	4, 539	64, 763	519, 953	219, 807
West Virginia	17, 227	----------	----------	17, 227	954
Total 1962	3, 230, 552	174, 771	495, 267	3, 900, 590	1, 279, 641
At merchant plants	390, 934	161, 761	427, 959	980, 654	165, 691
At furnace plants	2, 839, 618	13, 010	67, 308	2, 919, 936	1, 113, 950
Total 1961	3, 428, 923	150, 182	453, 101	4, 032, 206	1, 416, 974
Beehive coke:					
Pennsylvania	4, 722	----------	----------	4, 722	----------
Kentucky, Virginia, and West Virginia	----------	----------	1, 499	1, 499	300
Total:					
1962	4, 722	----------	1, 499	6, 221	300
1961	4, 604	----------	5, 063	9, 667	10, 990

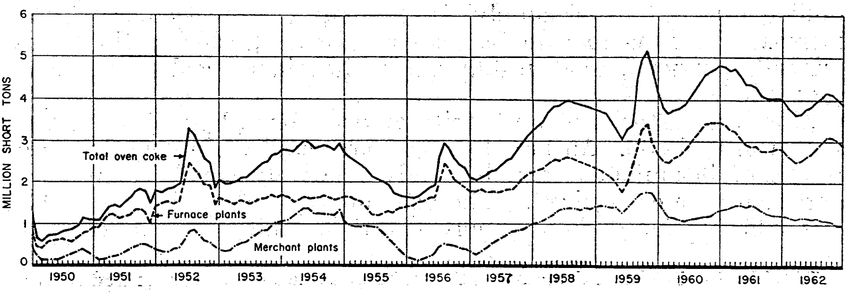


FIGURE 5.—Producers' stocks of oven coke in the United States, by months.

TABLE 35.—Month-end stocks of bituminous coal at oven-coke plants in the United States

(Short tons)

Month	1959	1960	1961	1962
January	12,123,513	11,428,017	10,483,155	9,778,578
February	11,801,729	11,241,870	9,788,567	9,407,933
March	11,684,172	11,148,141	9,551,136	9,404,688
April	11,569,096	11,324,365	9,331,749	9,431,344
May	11,837,123	11,916,169	9,851,556	9,668,244
June	12,424,398	12,391,359	9,932,172	10,360,167
July	9,566,108	10,342,992	8,495,602	8,256,863
August	9,394,516	10,742,409	8,936,261	8,276,856
September	9,261,161	10,918,346	9,135,237	8,179,859
October	9,375,872	11,082,639	9,813,136	8,622,170
November	10,127,812	11,203,784	10,452,933	8,849,458
December	11,495,611	11,028,816	10,392,751	8,305,379

TABLE 36.—Month-end stocks of anthracite at oven-coke plants in the United States

(Short tons)

Month	1959	1960	1961	1962
January	87,314	77,724	74,624	85,037
February	71,101	65,831	62,092	72,282
March	49,463	50,517	50,036	58,826
April	61,706	55,222	51,222	51,201
May	73,204	67,100	54,241	52,181
June	84,874	71,499	57,494	52,652
July	74,957	68,800	58,947	61,979
August	95,529	86,143	59,811	71,150
September	96,480	89,366	73,292	88,897
October	106,230	108,090	98,923	101,987
November	117,243	107,542	109,281	122,315
December	108,893	92,848	98,381	115,338

VALUE AND PRICE

The average value per ton, f.o.b. plant, of all oven and beehive coke produced in 1962, was $18.09; this average value was based upon the estimated market value of coke used and the actual market value of coke sold as reported by producers. This was a 2-percent increase over the unit value of coke in 1961 but was virtually the same value reported in 1957–59. Since coke prices closely follow the prices of coking coal, the increase in value over 1961 was due principally to a $0.06-per-ton increase in the value of coal carbonized in oven-coke plants.

The unit value, f.o.b. plant, of all oven coke sold commercially in 1962 was $21.19, $0.05 per ton more than in 1961 and the highest unit value for commercial sales of oven coke reported to date. This increase was caused directly by an increase in the price of oven coke sold to foundries, while the unit value of oven coke sold to blast furnaces remained at the same level as in 1961 and the prices of other industrial and residential-heating coke both declined. The value per ton, f.o.b. plant, of oven coke sold to blast furnaces was $15.98, compared with $30.25 to foundries, $16.37 to other industrial plants, and $14.10 for residential heating.

Average receipts per ton, f.o.b. plant, for overall sales of beehive coke in 1962 decreased slightly because of lower prices for coke sold to blast furnaces, to foundries, and for residential heating. The average value per ton for beehive coke sold to other industrial plants, however, was slightly higher than in 1961. Plant prices of beehive coke are substantially lower than the prices of oven coke because beehive coke is produced near the source of the coal used, whereas oven-coke prices generally reflect transportation charges on coal. Beehive coke is usually transported considerable distances to consuming centers, however, and the delivered prices of comparable grades of each type are usually quite similar.

The average values and prices per ton, f.o.b. plant, for oven and beehive coke produced and sold, as reported by producers, are shown in tables 37 and 38.

TABLE 37.—Average value per short ton of coke produced in the United States and average receipts per short ton from coke sold (commercial sales)

Year	Value per ton produced			Receipts per ton sold		
	Oven coke	Beehive coke	Total	Oven coke	Beehive coke	Total
1957–59 (average)	$18.14	$14.70	$18.07	$20.06	$14.67	$19.29
1960	18.38	14.61	18.31	20.25	14.55	19.59
1961	17.80	15.08	17.76	21.14	15.13	20.55
1962	18.14	14.96	18.09	21.19	14.95	20.62

TABLE 38.—Average receipts per short ton of coke sold (commercial sales) in the United States, by uses

Year	Oven coke—				Beehive coke—			
	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating	To blast-furnace plants	To foundries	To other industrial plants [1]	For residential heating
1957–59 (average)	$15.85	$29.39	$15.87	$17.15	$14.84	$16.72	$14.04	$11.64
1960	15.82	30.29	16.27	17.25	15.02	15.76	13.79	14.39
1961	15.98	30.07	16.67	17.12	15.94	16.02	14.94	16.87
1962	15.98	30.25	16.37	14.10	14.35	14.15	15.05	15.63

[1] Includes water-gas plants.

FOREIGN TRADE[4]

Imports.—Imports of coke were 12 percent greater than in 1961 and 17 percent greater than in the 1957–59 period. Coke imports are relatively small, however, compared with total consumption; imports during the past 5 years have averaged only 128,000 tons annually, while apparent consumption for the same period has averaged 54 million tons per year.

Ninety-three percent of the coke imported in 1962 originated in Canada. Nearly two-thirds of the Canadian shipments entered the United States through the Montana-Idaho and Washington customs districts. This coke was presumably used for nonferrous smelting and chemical processing in the northwestern parts of the United States where there are no coke plants. Virtually all of the remainder from Canada was imported through the Michigan customs district. This coke had a low unit value and was probably screenings or breeze.

Exports.—Exports of coke decreased 11 percent in 1962 and were 29 percent below the average for 1957–59. Exports have been rather stable during the past 5 years, however, averaging 409,000 tons annually, only about 4 percent more than the quantity exported in 1962.

Canada remained the principal export market, receiving four-fifths of the total shipments. Exports to Canada consisted principally of industrial-size coke, which was shipped chiefly through the Buffalo, Chicago, and Michigan customs districts. The remaining coke was exported to 20 other countries, with the largest quantities going to West Germany, Portugal, Brazil, Mexico, the Philippines, and India.

Exports to Europe increased nearly 75 percent because of shipments to West Germany and Portugal, the first since 1958. Shipments to Italy, however, were virtually eliminated. Exports to South America declined, chiefly because there were no shipments to Peru. The South American market has fluctuated during the past 5 years, and exports have ranged from 6,000 tons to 42,000 tons. Shipments to Asia also decreased because exports to Japan and Korea, which received 35,000 tons and 7,000 tons, respectively, in 1961, were negligible.

Table 40 shows the quantities and values of coke exported from the United States, as compiled by the Bureau of Mines from records of the Bureau of the Census. The data differ somewhat from exports reported by producers to the Bureau of Mines because some shipments actually do not leave the country until the following year. Also, certain types of shipments, such as those to U.S. Armed Forces overseas, are not listed as exports by the Bureau of the Census. Although the Bureau of the Census data do not show the grades or sizes of coke exported, the overall value per ton ($18.83) indicates that the bulk of the shipments was industrial-size coke purchased for use in blast furnaces, foundries, or other industrial plants.

---

[4] Figures on imports and exports compiled by Mae B. Price and Elsie D. Jackson, Division of International Activities, Bureau of Mines, from records of the U.S. Department of Commerce, Bureau of the Census.

TABLE 39.—Coke imported for consumption in the United States, by countries and by customs districts

	1960		1961		1962	
	Short tons	Value	Short tons	Value	Short tons	Value
Country:						
North America:						
Canada	125,905	$1,485,476	126,408	$1,539,486	132,076	$1,663,693
Netherlands Antilles	------	------	------	------	73	787
Total	125,905	1,485,476	126,408	1,539,486	132,149	1,664,480
Europe:						
Belgium-Luxembourg	440	12,863	110	3,230	720	21,029
Germany, West	------	------	------	------	69	18,297
United Kingdom	------	------	------	------	8,939	151,361
Yugoslavia	------	------	------	------	6	173
Total	440	12,863	110	3,230	9,734	190,860
Grand total	126,345	1,498,339	126,518	1,542,716	141,883	1,855,340
Customs district:						
Buffalo	1,430	17,436	1,468	11,422	2,264	20,023
Hawaii	440	12,863	110	3,230	759	22,413
Maine and New Hampshire	102	1,995	95	1,615	106	1,687
Michigan	53,413	449,248	52,361	447,202	45,519	394,972
Minnesota	------	------	49	352	102	879
Montana and Idaho	58,452	856,709	63,003	941,638	65,597	992,862
New Orleans	------	------	------	------	3,698	78,993
New York	------	------	------	------	79	960
St. Lawrence	75	2,543	------	------	304	9,491
San Francisco	------	------	------	------	547	4,626
South Carolina	------	------	------	------	5,271	89,281
Vermont	66	1,190	110	1,745	35	585
Washington	12,367	156,355	9,322	135,512	17,602	238,568
Total	126,345	1,498,339	126,518	1,542,716	141,883	1,855,340

Source: Bureau of the Census.

WORLD REVIEW

World production of oven and beehive coke in 1962 was estimated at 301.5 million short tons, a slight decrease from estimated production in 1961. Although production in 1962 increased in 22 countries, 7 countries had decreases that totaled 6.7 million tons, and the net decline in output was 3 million tons. The largest increases were recorded in Japan, Poland, Italy, the U.S.S.R., Czechoslovakia, and the United States. The United Kingdom, China, and West Germany had the largest decreases in output.

Europe, with 65 percent of the estimated world output, was the largest producer of coke. The U.S.S.R. was the largest European producer, with one-third of Europe's total, and West Germany followed, with one-fourth of the total European output. The U.S.S.R. also led in world production, with estimated output of 65 million tons, 22 percent of the total. Output in the U.S.S.R. was 25 percent greater than in the United States, the second-ranking producer, and this was the fifth consecutive year that the U.S.S.R. had produced more coke than any other country. West Germany, Europe's second-ranking producer, ranked third in world output. West Germany's production was 27 percent less than that of the U.S.S.R., and 8 percent lower than that of the United States. The other leading coke producers in Europe were the United Kingdom, France, Poland, and Czechoslovakia.

TABLE 40.—Coke exported from the United States, by countries and by customs districts

	1960		1961		1962	
	Short tons	Value	Short tons	Value	Short tons	Value
Country:						
North America:						
Canada	301,704	$5,707,215	343,445	$6,679,762	311,177	$6,052,007
Mexico	9,757	251,784	7,691	218,958	9,878	267,297
Panama	128	9,345	45	2,002	306	9,131
West Indies:						
Cuba	23,584	515,210	---	---	---	---
Trinidad and Tobago	---	---	116	2,522	113	2,573
Other West Indies	140	3,949	30	960	291	6,946
Other North America	106	5,224	80	2,293	220	5,205
Total	335,419	6,492,727	351,407	6,906,497	321,985	6,343,159
South America:						
Brazil	5,058	115,281	5,706	141,147	9,923	274,066
Chile	513	16,120	391	11,486	249	7,330
Columbia	54	2,238	156	3,555	251	4,983
Ecuador	64	2,588	148	2,897	175	3,289
Peru	73	2,800	10,224	186,196	---	---
Uruguay	471	10,500	---	---	---	---
Venezuela	17	1,302	37	884	263	7,833
Total	6,250	150,829	16,662	346,165	10,861	297,501
Europe:						
Belgium-Luxembourg	5	673	68	1,360	---	---
Denmark	---	---	---	---	325	6,792
Germany, West	---	---	---	---	46,262	500,526
Italy	59	981	32,964	412,080	15	396
Norway	30	1,260	---	---	---	---
Portugal	---	---	---	---	10,766	158,000
Sweden	1,549	40,113	---	---	---	---
United Kingdom	20	2,587	214	4,100	424	8,330
Total	1,663	45,614	33,246	417,540	57,792	674,044
Asia:						
India	---	---	967	20,578	1,386	27,307
Japan	---	---	34,933	372,744	6	100
Korea, Republic of	9,249	176,609	7,146	125,797	---	---
Philippines	435	19,500	871	23,250	2,190	80,358
Taiwan	---	---	---	---	61	899
Total	9,684	196,109	43,917	542,369	3,643	108,664
Oceania: Australia	---	---	---	---	15	570
Grand total	353,016	6,885,279	445,232	8,212,571	394,296	7,423,938
Customs district:						
Buffalo	84,525	1,665,055	104,501	2,046,371	69,242	1,514,987
Chicago	20,862	331,479	44,824	706,577	81,681	1,208,950
Connecticut	34	867	---	---	31,435	334,065
Dakota	10,843	296,538	9,410	281,360	8,308	248,334
Duluth and Superior	5,512	129,107	3,094	78,599	3,029	79,701
Florida	574	19,926	59	1,092	---	---
Laredo	6,898	191,984	6,224	187,831	8,908	240,493
Los Angeles	1,751	15,327	14,128	153,745	---	---
Maryland	144	5,237	500	10,978	100	4,338
Massachusetts	---	---	48,006	644,170	65	1,750
Michigan	149,780	2,832,632	156,623	3,110,461	138,856	2,755,363
Mobile	4,358	98,718	701	19,239	11,245	170,735
New Orleans	328	18,965	11,622	125,954	724	20,313
New York	30,205	653,176	11,746	248,565	9,243	266,340
Ohio	14,100	131,835	3,000	25,764	2,334	47,894
Philadelphia	3,912	77,307	7,538	108,356	19,408	290,898
Sabine	---	---	---	---	551	9,250
St. Lawrence	12,612	212,272	18,597	318,198	4,010	69,339
San Diego	970	39,416	794	23,315	858	22,151
Virginia	2,020	50,613	116	2,522	113	2,573
Washington	3,337	109,421	3,443	113,320	3,787	129,075
Other districts	251	5,404	306	6,154	399	7,389
Total	353,016	6,885,279	445,232	8,212,571	394,296	7,423,938

Source: Bureau of the Census.

Fourteen percent of the coke was produced in six Asiatic countries. More than three-fourths of the total, however, was produced in China and Japan. China was the chief producer, with nearly one-half of the production, but China's output was 10 percent less than in 1961. Japan's production increased 6 percent in 1962, and its output was 30 percent of the total in Asia.

Nineteen percent of the coke was produced in North America, and the United States supplied 91 percent of the total. Canada produced 7 percent, and Mexico produced the remainder.

Four South American countries, two in Africa, and three in Oceania also produced coke, but their combined output was only 2 percent of the total. Of these countries, Australia was the largest producer, with 3.1 million tons.

In addition to the high-temperature metallurgical coke produced in 1962, 50 million tons of other coke was produced in gas retorts and by various low- and medium-temperature coking processes and unconventional methods of carbonization. Most of this material consists of gashouse coke, low- and medium-temperature coke, and "formed coke." These types were produced in Europe. The leading producers were the United Kingdom and East and West Germany, with a combined output that was 68 percent of Europe's total. The United Kingdom produced 10.9 million tons of gashouse, or "soft," coke, chiefly by carbonizing bituminous coal in gas retorts. East and West Germany also carbonized large quantities of coal in retorts, and East Germany produced more than 7 million tons of coke from lignite. Poland also produced a large quantity of gashouse coke (1.2 million tons), and Czechoslovakia ranked second in the production of coke from lignite (2.4 million tons). Apparently, the lignite coke was briquetted and could be considered "formed coke," because lignitic coals are noncoking.

Seven Asiatic countries produced gashouse and low-temperature coke, with India and Japan producing 87 percent of the total. Japan's output was principally gashouse coke and India's was low-temperature coke.

The United States, Canada, three South American countries, three African countries, and two countries in Oceania also produced soft coke. Production in each, however, was less than 1 million tons.

TECHNOLOGY

Worldwide interest in coal carbonization in 1962 was evident from the large number of scientific and technical investigations conducted in most of the large coke-producing countries. The primary objectives of these studies were to (1) increase the efficiency of coke ovens, (2) improve the quality of the coke-oven products, (3) automate or mechanize certain phases of coking operations, and (4) reduce manufacturing costs. There was also considerable exploratory work to develop various carbonization methods for utilizing weakly coking or noncoking coals unsuitable for conventional systems.

In connection with unconventional carbonization methods, investigative tests, relating to the production of formed coke from the noncoking or weakly coking coals in countries of South America,

TABLE 41.—World production of oven and beehive coke (excluding breeze), by countries [1]

(Thousand short tons)

Country	1958	1959	1960	1961	1962
North America:					
Canada	3,313	4,095	3,873	3,900	4,022
Mexico	657	751	920	861	854
United States	53,604	55,864	57,229	51,711	51,910
Total	57,574	60,710	62,022	56,472	56,786
South America:					
Brazil	634	574	776	771	794
Chile	284	261	258	[2] 275	[2] 275
Colombia	331	273	463	220	[2] 220
Peru	36	35	33	40	44
Total	1,285	1,143	1,530	1,306	1,333
Europe:					
Austria	2,082	1,943	2,255	1,965	1,832
Belgium	7,613	7,955	8,310	7,948	7,931
Bulgaria	11	10	22	22	[2] 22
Czechoslovakia	8,124	8,684	9,323	9,410	9,700
Finland	-----	11	11	[2] 17	[2] 20
France	13,783	14,482	15,030	14,823	14,860
Germany:					
East [3]	1,097	1,108	1,111	1,135	[2] 1,160
West [4]	52,639	47,251	49,252	48,992	47,518
Hungary	369	399	550	658	[2] 830
Italy	3,704	3,366	4,095	4,296	4,769
Netherlands [5]	4,545	4,550	5,024	5,122	4,711
Poland	11,722	11,992	12,437	13,170	13,859
Rumania	621	671	904	1,036	1,233
Spain	2,261	2,653	2,837	2,877	2,997
Sweden	103	133	148	293	[2] 375
U.S.S.R	56,101	58,863	61,950	64,595	[2] 65,000
United Kingdom	20,665	19,093	21,094	19,968	17,430
Yugoslavia	1,135	1,179	1,194	1,210	1,220
Total	186,575	184,343	195,547	197,537	195,467
Asia:					
China [2]	19,800	24,300	27,600	22,000	19,900
India	3,386	4,739	5,267	8,264	8,267
Iran [6]	10	23	22	22	[2] 22
Japan	6,510	7,848	9,424	12,030	12,729
Korea, North [2]	470	500	550	550	550
Turkey	614	583	583	562	565
Total	30,800	38,000	43,450	43,400	42,050
Africa:					
Rhodesia and Nyasaland, Federation of: Southern Rhodesia	211	207	161	212	[2] 220
South Africa, Republic of	1,980	2,205	2,364	2,421	2,428
Total	2,191	2,412	2,525	2,633	2,648
Oceania:					
Australia	2,574	2,507	2,949	3,038	3,106
New Caledonia [2]	78	77	77	77	77
New Zealand	7	[2] 7	7	7	7
Total	2,659	2,591	3,033	3,122	3,190
World total	281,084	289,199	308,107	304,470	301,474

[1] Includes revisions of data published previously.
[2] Estimate.
[3] High-temperature coke from lignite.
[4] Includes electrode coke but excludes an estimated 100,000 tons of low-temperature coke
[5] Includes breeze.
[6] Year ended March 20 of year following that stated.

Compiled by Liela S Price, Division of Foreign Activities.

TABLE 42.—World production of gashouse and low- and medium-temperature coke (excluding breeze), by countries[1]

(Thousand short tons)

Country[2]	1958	1959	1960	1961	1962
North America:					
Canada	54	55	[3] 44	[3] 39	[3] 11
United States, retort, low- and medium-temperature	(4)	(4)	(4)	(4)	[5] 164
Total	285	275	275	150	285
South America:					
Argentina[3]	61	61	66	66	66
Chile	95	94	[3] 95	[3] 95	[3] 95
Uruguay	33	31	35	25	25
Total	189	186	196	186	186
Europe:					
Austria	357	276	250	273	327
Belgium	4	1			
Czechoslovakia:					
Gashouse	724	713	686	[3] 690	[3] 690
Lignite	2,306	2,406	2,399	[3] 2,400	[3] 2,425
Denmark	340	369	439	446	461
Finland	139	150	152	[3] 130	[3] 330
France:					
Gashouse[6]	1,484	1,124	766	480	271
Low-temperature	304	317	328	306	297
Germany:					
East:					
Gashouse[7]	3,303	3,456	3,534	3,400	[3] 3,420
Lignite	7,254	7,205	7,376	7,314	[3] 7,385
West:					
Gashouse	5,467	5,527	5,754	5,454	5,467
Lignite	659	656	664	662	661
Low-temperature	125	112	80	98	[3] 100
Greece	23	21	25	25	22
Hungary	517	529	547	534	559
Ireland (Eire)	90	91	106	[3] 105	[3] 105
Italy	913	882	899	850	833
Luxembourg	40	39	37	40	[3] 44
Netherlands[8]	625	480	322	257	220
Norway[8]	54	54	52	52	44
Poland:					
Gashouse	1,065	1,081	1,077	1,122	[3] 1,170
Low-temperature[3]	110	110	110	110	110
Portugal	43	39	43	44	34
Spain	297	300	273	279	246
Sweden	697	680	659	661	642
Switzerland	505	515	534	529	353
United Kingdom	12,483	11,279	11,050	10,967	10,886
Yugoslavia	29	23	22	19	20
Total	42,500	41,800	41,500	40,600	41,000
Asia:					
Ceylon[3]	13	13	13	13	11
Hong Kong[8]	20	22	20	10	19
India:					
Gashouse	137	142	141	140	[3] 140
Low-temperature	2,000	1,995	2,002	1,989	[3] 1,980
Japan:					
Gashouse	3,182	3,554	4,101	4,185	3,807
Low-temperature[3]	77	77	83	83	83
Malaya[3]	22	22	22	22	22
Taiwan[9]	203	190	214	207	123
Turkey:					
Gashouse	121	[3] 130	110	133	168
Low-temperature	89	91	93	91	93
Total	6,300	6,675	7,240	7,315	6,885
Africa:					
Algeria	97	98	103	[3] 95	[3] 75
South Africa, Republic of	93	82	67	111	121
United Arab Republic (Egypt)[3]	28	28	33	33	39
Total	218	208	203	239	235

See footnotes at end of table.

TABLE 42.—World production of gashouse and low- and medium-temperature coke (excluding breeze), by countries [1]—Continued

Country [2]	1958	1959	1960	1961	1962
Oceania:					
Australia [10]	931	914	850	856	[3] 850
New Zealand [11]	82	86	80	86	97
Total	1,013	1,000	930	942	947
World total	50,510	50,140	50,340	49,430	49,540

[1] Gashouse coke unless otherwise specified. Includes revisions of data published previously. Data do not add to totals shown, owing to rounding.
[2] Production data for China, Mexico, Rumania, and the U.S.S.R. not available; estimates included in totals.
[3] Estimate.
[4] Concealed to avoid disclosing individual company data. Production included in total.
[5] Includes high-temperature coke from unconventional processes.
[6] Data previously reported represented commercially disposable production.
[7] Includes high-temperature coke.
[8] Includes breeze.
[9] Includes other cokes.
[10] Year ended June 30 of year stated.
[11] Year ended March 31 of year following that stated.

Compiled by Liela S. Price, Division of Foreign Activities.

North Africa, and the Far East, were described in a report published in 1962.[5]

Laboratory investigations, pilot plant development, and cupola tests in Perth, Australia, from 1949 to 1958 for the preparation of a metallurgical fuel from Western Australia subbituminous, noncoking coal were described in a paper presented at the Sixth World Power Conference in Melbourne, Australia, in 1962. Essentially, the stages in the processes are (1) carbonizing the coal to 800° C with recovery of tar, (2) crushing the char produced, (3) briquetting the ground char with tar from carbonization, (4) curing the raw briquets at 200° C in flue gas containing air, and (5) carbonizing the briquets to 500° to 600° C. The product was reported to be a fuel of high strength and low ash and to perform excellently in iron foundry cupolas.[6]

In addition to the development work conducted on formed coke in Wyoming and coke pellets in Utah, described in the technology section of this chapter for 1961, laboratory-scale production of formed coke from noncoking coals of the Western United States was studied at Montana State College, and two processes, designated as the kiln and retort processes, were developed. In the kiln process washed fines are heated by the combustion of volatile matter evolved from carbonization, and the resulting char is ground and briquetted with asphalt. The retort process is similar, except that the volatile products are collected for the recovery of light oil, creosote, and pitch, and the coal is partly dried before being fed into the retort.[7] Exploratory and development work was done on unconventional carbonization methods in Great Britain, France, West Germany, East Germany, Poland, Bulgaria, Japan, India, and possibly several other countries.

---

[5] Mewes, R. Herstellung von Formkoks für kleine Hochöfen und Giessereiöfen aus zur normalen Verkokung ungeeigneten Kohlen. (Production of Formed Coke for Small Blast Furnaces and Foundries from Coals Unsuitable for Normal Coking) Erdöl u. Kohle, v. 15, July 1962, pp. 530–535.
[6] Samuel, L. W., S. Uusna, and R. P. Donnelly. Production of Metallurgical Fuel From Sub-Bituminous Coal (in Western Australia). Paper 68, 111.3, pres. at 6th World Power Conf., Melbourne, Australia, Oct. 20–27, 1962, pp. 18–19.
[7] Berg, L. Synthetic Coke Briquets From Non-Coking Coal. Blast Furnace and Steel Plant, v. 50, No. 6, June 1962, pp. 558–559.

To increase the strength of blast-furnace coke, the Broken Hill Proprietary Company at its Newcastle, New South Wales, Australia, works added 0.3 percent of bentonite to the coal. Tests showed that the addition of this small percentage increased the ASTM stability factor of the coke from 15–20 to 20–30. In addition, it was cheaper to use bentonite rather than "southern" coal, which achieved the same increase in coke strength. The improvements in blast-furnace performance when using stronger coke appeared to jusify the large-scale use of bentonite to raise coke quality.[8]

The effect of coke sizes on blast-furnace performance was studied for an 11-month period (October 1960–September 1961) by an iron- and steel-producing company in the United States. During this period the coking-coal blend and the ore burden remained relatively constant. Also, the chemical properties of the coke were fairly stable, with moisture ranging between 4 and 6 percent, ash ranging between 7.5 and 8.5 percent, sulfur at 0.6 percent, fixed carbon at 91 percent, and volatile matter ranging between 0.6 and 0.9 percent. One item that did vary, however, was the stability of the coke, which seemed to be directly related to the coking time. Stability and coke sizes increased with longer coking periods. Coke sizes were also controlled by closing the crusher rolls from 6.25 to 4.5 inches during the last 4 months of the study. Blast-furnace performance indicated that smaller coke improved iron production and lowered the coke rate, but the optimum size for best blast-furnace performance could not be ascertained with the limited tests conducted. It was concluded that this variable could be determined only with extensive research under fully controlled conditions.[9]

For many years there has been considerable interest in the losses of energy from the quenching of coke with water, but thus far little progress has been made on the problem. Various dry-cooling schemes have been proposed, however, and in 1962, a British patent was granted to the Didier-Werke A.G., Essen, Federal Republic of West Germany, for the design of facilities for cooling coke. In this process, hot coke is discharged from a coke car into a cooling chamber that is divided into a number of cells which hold coke from several ovens. Inert gas is distributed evenly over the base of the cells by refractory ducts having several outlet ports. The gas leaves the cells by ports near the top of the chamber wall and passes to a boiler. The coke is discharged continuously from the base of each cell by star drums into ducts provided with double water seals and from there onto a conveyor.[10]

The value of petrological studies for the interpretation of factors influencing the strength of coke was clearly demonstrated at the Applied Research Laboratory of the U.S. Steel Corp.[11] In another study, coke reactivity was correlated with the structure of coke. This can be done by using a scanning device that automatically traverses a coke specimen and measures and records relative reflectance. By the reflectance, a definite relationship was found between coke reactivity and coke structure.[12]

---

[8] Gregory, J. A. Full-Scale Coke-Oven and Blast-Furnace Trials With Bentonite Coke. Proc. Australia Inst. of Min. Eng., 1962, pp. 81–96.

[9] Wrenn, T. K. Small Size Coke and Its Effect on Blast-Furnace Operation. Blast Furnace and Steel Plant, v. 50, No. 6, June 1962, pp. 518–522.

[10] Didier-Werke A.G. Improvements in and Relating to Coke Dry Cooling. Brit. Pat. 898,491, 1962.

[11] Shoenberger, R. W., N. Schapiro, and J. D. Clendenin. Factors Affecting the Coking Strength of Pittsburgh-Seam High Volatile A Coal. Blast Furnace, Coke Oven and Raw Materials Proc. AIME v. 21, 1962, pp. 373–389

The British Coke Research Association reviewed various methods for studying the plastic behavior of coal during carbonization and concluded that the most promising approach to a satisfactory method of assessing coking properties was probably one based on investigation of (1) pressure development within the plastic layer and (2) the behavior of the semicoke formed from the viewpoint of shrinkage and fissuring.[13]

A study was made in Poland to determine, quantitatively, the effect of ash in coking coal on coking properties by using the Roga test. It was believed that the magnitude of reduction in the Roga test, by an increase of the ash, might be a suitable index for assessing the usefulness of a coal for coking. Results indicated that a unit increase in the percentage of ash of some Polish coals reduced the Roga index by about 1.8, and for several other types of coal the reduction was even greater.[14]

A process for refining crude coke-oven light oil designed to make the derivatives competitive with petroleum-chemical products was developed in the United States by the Houdry Process and Chemical Co. This method, known as the Litol process, uses a single reactor for the three catalytic phases of desulfurization, hydrocracking, and hydrodealkylation. Hydrogen for the process may be obtained by the reforming of low-boiling paraffins obtained in coke-oven products. Increased yields of high-purity benzene (99.9570 percent) are claimed because losses associated with acid washing are eliminated.[15]

Carbonization research by the Bureau of Mines in 1962 included technological and investigative studies relating to (1) the mechanism and kinetics of coal carbonization, (2) the carbonizing behavior of coals and blends, (3) entrainment carbonization, (4) carbonization assays under atmospheric and elevated pressures, (5) utilization of lignitic coals and products derived therefrom, and (6) upgrading, characterization, and utilization of low-temperature tars. These studies were conducted at the Morgantown (W. Va.) Coal Research Center, the Pittsburgh (Pa.) Coal Research Center, the Denver (Colo.) Coal Research Laboratory, and the Grand Forks (N. Dak.) Lignite Research Laboratory.

Investigative studies on the thermal decomposition of tars were continued in 1962 at the Pittsburgh Coal Research Center where low-temperature tars were thermally cracked in a fluidized-bed reactor under controlled conditions of temperature, contact time, bed composition, and atmosphere. These studies were to determine whether the potential value of the final products could be improved by thermal cracking of low-temperature tar and tar vapors.

The mechanism of coking was studied, and several special techniques and procedures to isolate any reaction were developed, including a gas-chromatographic method for analyzing C_3 and C_4 hydrocarbons produced in the fluidized carbonization of coal.

---

[12] Chemical and Engineering News. V. 40, No. 39, Sept. 24, 1962, p. 76.

[13] The British Coke Research Association (Chesterfield, Derbyshire, England). A Review of Methods for the Examination of the Thermal Softening and Plasticity of Coal. Special Pub. 6, August 1962, 19 pp.

[14] Mielecki, T. Diminution of Caking Capacity Due to Increased Ash Content: An Index of Coking Properties of Bituminous Coals. Fuel Abs. and Current Titles, v. 3, 1962, p. 3877.

[15] Chemical Week. Better Break for Coke-Oven Benzene. V. 90, No. 14, Apr. 7, 1962, p. 55

In order to make a scientific study of the traveling-grate coking process, work was started in August 1961 using a chain-grate coker constructed in the Combustion Laboratory at Pittsburgh. During 1962, several tests on different coals were conducted to study (1) fuel-bed thickness, (2) grate speed, (3) air-fuel ratio, (4) distribution of air under grate, and (5) size consist of coal.

In the continuing survey of the carbonizing properties of U.S. coals, 6 coals from Virginia, 14 from West Virginia, and 1 from Oklahoma were tested. In addition, the expanding properties of 30 coals from West Virginia, Virginia, Oklahoma, Kentucky, and Pennsylvania were investigated.

Carbonization research conducted at the Denver, Colo., research laboratory in 1962 covered a wide range of studies related to the utilization of the low-rank coals of the Western United States. Virtually all pilot plant work on entrainment carbonization was done with the new 10-inch, refractory-lined, internally heated retort. This reactor is heated entirely by the internal combustion of carbonization products. Eleven runs were made with coking coals, and all but one were smooth and trouble-free. The difficulty with the 11th run was attributed to an attempt to operate with 60 percent of the reactor inactive. The reactor was tested to determine if a low-rank, high-moisture coal could be carbonized in a single step without previous drying. It performed very well, and capacity was higher than expected.

Work continued on pressure carbonization, and information on yields of products was being assembled for publication.

A test program was initiated in 1962 to determine whether char produced by entrainment techniques could be used effectively as a blend component with western coking coals. If successful, this could displace some of the expensive low-volatile coals from the East which are currently used by western steel companies. Exploratory work was also done on pelletizing and recarbonizing char, with particular reference to the effect of tar and bentonite as additives, the effect of an oxidation pretreatment, and the effect of recarbonization with natural gas.

Research on upgrading and utilization of low-temperature tar continued at the Morgantown Coal Research Center. Considerable time and effort was devoted to the problem of upgrading low-temperature tar pitch. Because pitch is the principal derivative when refining coal tar (comprising 25 to 50 percent of the original tar), methods or processes for upgrading low-temperature tar pitch suitable for current commercial applications are desirable. Based on the Bureau's studies and industry experience, softening point is probably the most important property of pitch when used as a binder in the manufacture of carbon electrodes. For this reason, more emphasis was given to softening-point control in the latter part of 1962. Three methods of controlling the softening point were used, as follows: (1) Oxidation of pitch by air blowing, (2) blending different pitches, and (3) control of distillation cutoff temperatures. Although each method contributed knowledge to the pitch problem, further research is necessary to develop the best method for controlling the softening point and, also, for increasing the carbon-hydrogen ratio.

Studies were made in 1962 to evaluate different catalysts and to test various temperatures and pressures to find the best conditions for the dealkylation of neutral oils. The main objective was to develop the most effective catalyst for oxdizing the product material (neutral oils) to maleic and phthalic anhydride. Results of these tests showed that cobalt-molybdenum catalyst was the most effective for conversion to phthalic anhydride, and cobalt-oxide yielded the highest recovery of maleic anhydride.

Low-temperature coal tars contain substantial amounts of tar acids, rich in highly alkylated phenols which have no market value as chemicals. One way to upgrade this material is by dealkylation. During 1962 most of the work was devoted to testing various types of catalysts to determine the most suitable for the dealkylation of tar acids. Eleven different catalysts were tested, and the standard silica-alumina bead gave the best results.

In view of the large demand forecast for biodegradable detergents, an exploratory study was made in 1962 to develop techniques for the separation of n-olefins from paraffins in hexane-solubles distillate. Straight-chain paraffins and olefins can be separated from the hexane-solubles distillate by urea adduction, but the further separation of n-olefins appears impractical. Therefore, the dealkylation of benzene was attempted with the mixture of paraffins and olefins to produce detergents directly.

The possibility of producing cheap resins from crude tar-acid fractions from low-temperature tar was investigated. Several of the resins prepared possessed the physical properties and cure times of commercial resins, and further tests will be made for final evaluation and comparison with present laminating resins.

Research work continued on the characterization of the thermally labile pitch oils from low-temperature coal tar. Studies demonstrated that, under similar operating conditions, aromatic hydrocarbon samples can be analyzed virtually as well by liquid chromatography as by gas chromatography. Other characterization studies on low-temperature tar products included high-boiling neutral oil fractions (275°–344° C and residue over 344° C). The high-boiling neutral oil fractions and the residue were subjected to countercurrent distribution fractionation with a dual solvent system of isooctane and 90 weight-percent ethanol in water. Ultraviolet and infrared spectra were obtained on the resulting fractions, and quantitative distribution curves were constructed for n-alkanes, a-olefins, trans-internal olefins, 2-methylalkanes, and branched a-olefins. From these, the weight-percent of each class of aliphatic hydrocarbon was calculated for each narrow-boiling range of neutral oil.

An assay method for low-temperature tars from various sources was developed at the Grand Forks Lignite Research Laboratory. This proposed assay is essentially a simple distillation process followed by chromatographic examination of the distillate or its fractions recovered by solvent fractionation of the whole distillate. Additional information may be obtained by an examination of spectra, both infrared and ultraviolet, recorded for different fractions or components separable by chromatographic methods.

Production of tailored carbons and use of lignite in iron ore processing were studied during 1962. Investigative studies indicated that activated carbon, with adsorptive properties equal to or better than those of commercial activated carbons, could be produced from carbonized lignite in a fluidized-bed reactor. To explore areas in which lignite or lignite char could be used as a fuel or reductant, particularly in the beneficiation and reduction of iron ore, a laboratory-scale lignite carbonizer was constructed to produce chars under controlled conditions of temperature and carbonization atmosphere. A second apparatus was developed to determine oxygen-char reactivity using a modified crossing-point technique.

An annual World Review of Pyrolysis of Coal was published in the Industrial and Engineering Chemistry Annual Review Supplement in 1962. This review summarized research and technologic studies relating to the following phases of coal pyrolysis: (1) mechanism kinetics and thermochemistry and (2) low- and high-temperature carbonization, products, and byproducts.

The British Coke and Research Association, Chesterfield, Derbyshire, England, publishes a quarterly guide of published material of interest to the coking industry. This coke review consists of a complete bibliography of publications and articles on coking. In addition, a brief summarization or digest of the more important articles and publications is included in each quarterly report.

COAL-CHEMICAL MATERIALS

GENERAL SUMMARY

When bituminous coal is heated above its decomposition temperature in the absence of air in a coke oven, the volatile matter in the coal is driven off, leaving a solid low-volatile residue. The volatile matter released is recovered in collecting mains and is of complex composition at high temperature in the vapor state. It is processed to produce the four major primary products—tar, ammonia, light oil, and gas—by preferential condensation and absorption operations. Initial cooling upon leaving the carbonizing chamber results in the condensation of the heavier high-boiling constituents comprising coal tar; further cooling with water and scrubbing with sulfuric or phosphoric acids affects the recovery of ammonia, either as an aqueous solution or in the form of ammonium sulfate or diammonium phosphate; still further cooling, followed by oil washing, removes light oils consisting of benzene, toluene, xylene, solvent naphtha, and naphthalene. After this point in the system, only gas remains as the final primary product. In addition to the four primary products, other materials occur in small quantities which may or may not be recovered, depending on economic conditions and other factors. These products include sulfur, which can be recovered by processing gas further; cyanogen and related materials recoverable from cooling waters; pyridine, produced by treating the ammonium sulfate liquor; and carbolic material present in light oil and still wastes.

In the United States, high-temperature carbonization is applied largely to the manufacture of metallurgical coke rather than to the manufacture of gas and chemical raw materials. This practice is based on the fact that roughly 75 percent of the coal charged into coke ovens is recovered in the form of coke (including breeze), about

17 percent is recovered as gas, and the remaining 8 percent is recovered as chemical raw materials. Although there have been many improvements in design and efficiency of recovery facilities, yields of coal-chemical materials have not varied greatly in the past half century.

As indicated in figure 6, yields of crude tar, crude light oil, and ammonia, in terms of sulfate equivalent, have not changed greatly from the yields of 1920. The rise from 5.2 thousand cubic feet of surplus gas to 6.6 in recent years may be attributed to the larger proportions of producer gas and blast-furnace gas used for underfiring, thereby increasing the volume of surplus gas available for other purposes.

Although the main purpose of recovering and marketing coal-chemical materials is to defray, to some extent, the costs of converting coal into coke, the proportion of the total value of all coke-oven products credited to coal-chemical materials, including surplus gas, has declined steadily in recent years. For example, the value of coal chemicals represented 13 percent of the total value of all coal products in 1962: surplus gas, 9 percent; and coke (including breeze), 78 percent. This was very different from returns in the 1920's and throughout the 1930's, when coal chemicals represented between 17 and 20 percent of the value of all products and surplus gas represented 15 to 22 percent. Before World War II, natural gas entered large space-heating markets formerly supplied by coke and coke-oven gas. However, wartime shortages of steel delayed natural-gas pipeline construction and temporarily enabled coke and coke-oven gas to continue serving some markets, particularly along the eastern seaboard. The end of the war brought a rapid expansion of pipelines, permitting natural gas again to replace coke and coke-oven gas in many areas. The loss of these lucrative markets caused many merchant and gas-utility coke plants to discontinue carbonizing activity or, in the case of furnace plants, to divert their surplus gas for use within the steel plant. These developments naturally affected the value credited to surplus gas.

In addition to the decline in revenue from coke-oven gas, the proportion of value credited to the chemical raw materials—coal tar, crude light oil, and ammonia—decreased in recent years. The principal contributing factor was the dynamic expansion in production of aromatic chemicals, anhydrous ammonia, and aliphatic chemicals from the processing of natural gas and crude petroleum. Technological advancements in processing natural gas and petroleum have enabled the petrochemical industry to manufacture high-purity products concomitant with reductions in manufacturing costs and prices. These developments affected coke-oven products, because prices on coal chemicals had to be reduced for competitive purposes. This is illustrated graphically in figure 7, which shows the steadily shrinking proportion of the value of coke-oven products credited to chemical raw materials and gas.

Table 44 shows in detail the value of coal-chemical materials, by product group, per ton of coal carbonized in 1962 and for several previous years. Because of sharp decreases in benzene prices and lesser decreases in the prices of toluene and xylene, the product group showing the largest decrease from 1957–59 was light oil. Since benzene represents 76 percent of the total realization from the sale of light-oil products, its price influences receipts for this product group.

The value of surplus gas, however, accounted for 42 percent of the value of all coal-chemical materials, followed by crude tar and its derivatives with 35 percent. Ammonia products, which in the early 1920's returned the greatest revenue of any product group, furnished only 8 percent.

To measure the importance of coal-chemical materials to coke-plant operators, table 45 shows the percentage of coal costs that are recovered by the producing companies through the sale and use of coal-chemical materials. In 1962, nearly 37 percent of coal costs could be credited to coal-chemical materials. This was slightly less than the 39 percent obtained during the 1950's. Even this figure was considerably lower than in the 1920's and 1930's when 56 and 61 percent, respectively, was contributed by coal-chemical materials.

The value of all coal-chemical materials sold, including surplus gas used by producing companies, decreased 8 percent from the 1961 value and was 34 percent less than the alltime high of 1957. The decrease from 1957 was due to lower prices and to a decline in production of all products.

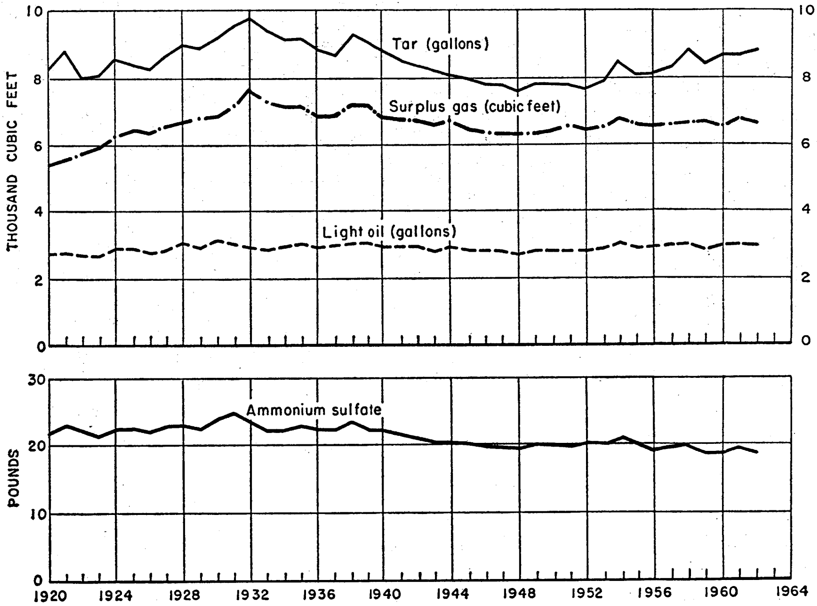


FIGURE 6.—Average yield of principal coal-chemical materials per short ton of coal carbonized in coke ovens in the United States. Yields of light oil and ammonium sulfate equivalent represent average for plants recovering these products.

COKE-OVEN GAS

Production of coke-oven gas declined 2 percent from the 1961 total and 14 percent below the 1957–59 average. The reduction in gas output in 1962 was due to a smaller yield. From the early 1920's to

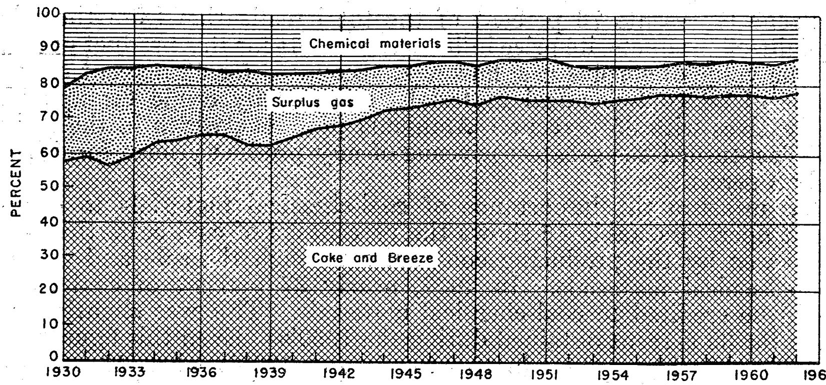


FIGURE 7.—Percentage of total value of coke-oven products from slot ovens supplied by coke and breeze, surplus gas, and chemical materials in the United States.

1940, the yield of gas remained above 11 thousand cubic feet per ton of coal, but from 1940 to 1962 the yield was slightly lower, averaging approximately 10.5 thousand cubic feet. The primary reason for higher gas yields in the earlier period was the large number of merchant and gas-utility plants that placed more emphasis on gas production. Yields declined slowly during and following World War II when metallurgical coke was in short supply and most of the industry was geared to maximum production of metallurgical coke. The lowest yield in 48 years was reached during the Korean conflict when the industry averaged only 10.15 thousand cubic feet per ton of coal. Since 1952, yields have varied slightly from year to year, reaching a high of 10.70 thousand cubic feet in 1961.

Table 47 shows the production and disposal of coke-oven gas in 1962, by States. Thirty-five percent of the gas produced was used to heat the ovens, 63 percent (classified as surplus gas) was used and sold by the producing companies, and the remainder was wasted or unaccounted for. As shown in table 47, 94 percent of the gas wastage occurred at furnace plants because storage facilities usually are not available at iron and steel plants and gas produced over weekends when heating and annealing steel furnaces are banked is flared or burned in the atmosphere.

Table 48 shows the disposal of surplus coke-oven gas by uses and by States. Furnace plants used most of their surplus gas in integrated metallurgical furnaces and sold only 4 percent. Merchant plants, however, were not able to consume such a large proportion and sold or marketed 75 percent of their surplus. In 1962, merchant plants used only one-fourth of their surplus gas, 67 percent of which was used under boilers. Coke-oven gas, which is distributed through city mains and which is generally used for residential heating and cooking, averaged $0.429 per thousand cubic feet. This was more than double the average value for gas used by the producers for various purposes or sold to other consumers for industrial use.

Slot ovens are usually operated continuously, and most of the fuel requirements for heating the ovens are met by the coke-oven gas originating in the oven after the removal of the chemical raw materials.

TABLE 43.—Coal-chemical materials, exclusive of breeze, produced at coke-oven installations in the United States in 1962 [1]

Product	Produced	Sold			On hand Dec. 31
		Quantity	Value		
			Total	Average	
Tar, crude ....gallons..	650, 111, 702	[2] 303, 885, 750	$36, 646, 318	$0. 121	34, 496, 025
Tar derivatives:					
Sodium phenolate or carbolate..do....	3, 166, 381	3, 155, 820	491, 988	. 156	169, 143
Crude chemical oil (tar-acid oil).do....	37, 043, 569	35, 854, 284	7, 628, 084	. 213	2, 110, 775
Pitch of tar: [3]					
Soft..........short tons..	839, 315	138, 595	2, 708, 866	19. 545	22, 127
Medium..........do....	35, 395	[4] 16, 685	593, 055	35. 544	5, 179
Hard..........do....	235, 700	[4] 63, 617	2, 363, 668	37. 155	344
Other tar derivatives [5]..........	----------	----------	11, 752, 339	----------	----------
Ammonia products:					
Sulfate..........short tons..	585, 380	[4] 657, 795	17, 468, 019	26. 555	115, 502
Liquor (NH_3 content)..........do....	13, 577	12, 897	927, 152	71. 889	1, 204
Diammonium and monoammonium phosphate..........do....	32, 585	[4] 25, 991	2, 597, 296	99. 931	4, 841
Total..........	----------	----------	20, 992, 467	----------	----------
Sulfate equivalent of all forms..........short tons..	670, 630	733, 904	----------	----------	125, 013
NH_3 equivalent of all forms.....do....	172, 888	189, 177	----------	----------	32, 228
Gas:					
Used under boilers, etc. thousand cubic feet..	[6] 766, 102, 074	73, 394, 692	14, 697, 527	. 200	----------
Used in steel or allied plants....do....		363, 086, 894	83, 250, 385	. 229	----------
Distributed through city mains.do....		22, 699, 500	9, 747, 274	. 429	----------
Sold for industrial use..........do....		24, 697, 702	4, 301, 983	. 174	----------
Total..........do....	766, 102, 074	483, 878, 788	111, 997, 169	. 231	----------
Crude light oil..........gallons..	[7] 211, 687, 939	27, 017, 854	3, 401, 068	. 126	4, 833, 467
Light-oil derivatives:					
Benzene:					
Specifications grades (excluding motor grade).....do....	114, 227, 183	116, 409, 505	26, 871, 599	. 231	7, 430, 057
Motor grade..........do....	1, 786, 159	1, 784, 496	342, 565	. 192	27, 982
Toluene (all grades)..........do....	27, 230, 734	27, 373, 766	5, 578, 346	. 204	1, 568, 339
Xylene (all grades)..........do....	7, 577, 883	7, 196, 906	1, 831, 088	. 254	1, 068, 293
Solvent naphtha (crude and refined) gallons..	4, 283, 995	4, 304, 452	1, 042, 776	. 242	246, 242
Other light-oil derivatives..........do....	4, 232, 892	2, 627, 167	335, 709	. 128	282, 915
Total..........do....	159, 338, 846	159, 696, 292	36, 002, 083	. 225	10, 623, 828
Intermediate light oil..........do....	5, 180, 444	4, 428, 019	570, 300	. 129	225, 957
Grand total..........	----------	----------	235, 147, 405	----------	----------

[1] Includes products of tar distillation conducted by coke-oven operators under same corporate name.
[2] Includes 27,821,730 gallons sold to affiliated companies for refining and a small amount exported.
[3] Soft—water-softening point less than 110° F; medium—from 110° to 160° F; hard—over 160° F.
[4] Includes small amount exported.
[5] Creosote oil, cresols, cresylic acid, naphthalene, phenol, pyridine, refined tar, and tar paint.
[6] Includes gas used for heating ovens and gas wasted.
[7] 188,952,363 gallons refined by coke-oven operators to make derived products shown.

Eighty-four percent of the gas required for underfiring was coke-oven gas; 15 percent was blast-furnace gas; and the remaining 1 percent consisted of natural gas, producer gas, and hydrogen-free coke-oven gas. As shown in table 49, blast-furnace gas was used exclusively by furnace plants, whereas producer gas was used by merchant plants. In the two decades between World Wars I and II, producer gas was used widely by merchant plants and ranked next to coke-oven gas in volume. By using producer gas, this group was able to send more of their coke-oven gas through city mains.

TABLE 44.—Average value of coal-chemical materials used or sold and of coke and breeze produced per short ton of coal carbonized in the United States

Product	1957-59 (average)	1960	1961	1962
Ammonia products	$0.307	$0.274	$0.317	$0.286
Light oil and its derivatives	.687	.739	.661	.545
Surplus gas used or sold	1.592	1.577	1.572	1.527
Tar and its derivatives (including naphthalene):				
Tar burned by producers [1]	.427	.407	.328	.404
Sold	.828	.850	.964	.848
Total	3.841	3.847	3.842	3.610
Coke produced	12.749	12.956	12.447	12.640
Breeze produced	.308	.344	.345	.324
Grand total	16.898	17.147	16.634	16.574

[1] Includes pitch of tar.

TABLE 45.—Value of coal recovered by coal-chemical materials in the United States

(Percent)

	1957-59 (average)	1960	1961	1962
Product:				
Ammonia products	3.1	2.8	3.2	2.9
Light oil and its derivatives	6.9	7.5	6.7	5.5
Surplus gas used or sold	16.1	15.9	16.1	15.5
Tar and its derivatives used or sold (including naphthalene)	12.7	12.7	13.2	12.7
Total	38.8	38.9	39.2	36.6
Value of coal per short ton	$9.90	$9.89	$9.79	$9.85

TABLE 46.—Coal equivalent of the thermal materials, except coke, produced at oven-coke plants in the United States

Year	Materials produced				Estimated equivalent in heating value [1] (billion Btu)					Coal equivalent (thousand short tons)
	Coke breeze (thousand short tons)	Surplus gas (billion cubic feet)	Tar (thousand gallons)	Light oil (thousand gallons)	Coke breeze	Surplus gas	Tar	Light oil	Total	
1913	735	64	115,145	3,000	14,700	35,200	17,272	390	67,562	2,600
1918	1,999	158	263.299	87,562	39,980	86.900	39.495	11,383	177,758	6,785
1929	4,853	508	680,864	200,594	97,060	279,400	102,130	26,077	504,667	19,262
1939	3,354	434	554,406	170,963	67,080	238,700	83,161	22,225	411,166	15,693
1949	4,929	546	672,407	228,754	98,580	300,300	100,861	29,738	529.479	20,209
1957-59 (average)	4,077	568	732,173	244,118	81,532	312,400	109,826	31,735	535,493	20,439
1960	3,705	521	687.560	234,501	74,100	286,550	103,134	30.485	494,269	18,865
1961	3,337	490	633.378	214,003	66,740	269,500	95,007	27,820	459,067	17,522
1962	3,425	484	650,112	211,688	68,500	266,200	97,517	27,519	459,736	17,547

[1] Breeze, 10,000 Btu per pound; gas, 550 Btu per cubic foot; tar, 150,000 Btu per gallon; and light oil, 130,000 Btu per gallon.

TABLE 47.—Production and disposal of coke-oven gas in the United States in 1962, by States

(Thousand cubic feet)

State	Produced		Used in heating ovens	Surplus used or sold			Wasted
					Value		
	Total	Per ton of coal coked		Quantity	Total	Average	
Alabama	56,416,257	9.93	25,848,735	28,999,743	$4,115,592	$0.142	1,567,779
California, Colorado, and Utah	43,742,036	11.41	13,820,934	29,723,523	6,181,901	.208	197,579
Connecticut, Maryland, New Jersey, and New York	102,543,823	10.98	30,589,290	70,594,847	24,622,619	.349	1,359,686
Illinois	30,398,624	10.68	8,641,976	20,009,450	3,382.831	.169	1,747,198
Indiana	103,448,809	10.24	37,287,038	65,268,321	13,383,628	.205	893,450
Kentucky, Missouri, Tennessee, and Texas	24,797,522	9.91	11,831,449	10,459,826	1,526,000	.146	2,506,247
Michigan	43,452,340	10.01	7,878,664	35,467,612	7,728,605	.218	106,064
Minnesota and Wisconsin	9,504,155	9.51	5,019.301	4,422,027	905,563	.205	62,827
Ohio	97,948,072	10.00	36,143,295	61,314,136	15,593,188	.254	490,641
Pennsylvania	210,200,676	10.50	81,837,296	126,730,394	27,273.423	.215	1,632,986
West Virginia	43,649,760	11.27	12,404,141	30,888,909	7,283,819	.236	356,710
Total 1962	766,102,074	10.45	271,302,119	483,878,788	111,997,169	.231	10,921,167
At merchant plants	70,800,496	9.28	31,720,166	38,399,878	11,525,589	.300	680,452
At furnace plants	695,301,578	10.58	239,581,953	445,478,910	100,471,580	.226	10,240,715
Total 1961	777.948,787	10.70	276,673,792	489,980,340	114,298,696	.233	11,294,655

CRUDE COAL TAR AND DERIVATIVES

Production of crude coal tar in 1962 increased 3 percent over 1961 production, mainly because of an increase in yield, which was the highest since 1939. Generally, tar yields increase when oven temperatures decrease and coking cycles are lengthened. This is illustrated clearly in figure 6, which shows that tar yields were highest, averaging 9.17 gallons per ton of coal carbonized, during the depression years of 1930–39. Other factors that influence tar yields are rank and grade of the coal carbonized, completeness of tar recovery, and condition of oven batteries and recovery facilities. For these reasons, tar yields among plants vary widely; tar yields ranged between 4 and 11 gallons per ton of coal in 1962. The lowest yield was in Minnesota and Wisconsin, mainly because a substantial part of the coke produced was foundry coke, requiring high percentages of low-volatile bituminous coal and anthracite fines in coking-coal mixtures, which reduced tar yields. The highest yields were in West Virginia, the Western States (California, Colorado, and Utah), and Pennsylvania, where greater proportions of high-volatile coals were used in the coking-coal admixtures. For example, in West Virginia 84 percent of the coal mixtures charged into coke ovens in 1962 was high volatile.

Crude coal tar is used principally as a raw material for the manufacture of various tar products. Its use in crude form as fuel has decreased steadily in recent years, although 7 percent of the output in 1962 was used in this manner.

Tar processing began as a separate industry in the United States shortly after the first slot ovens were constructed before the turn of

TABLE 48.—Surplus coke-oven gas used by producers in the United States and sold in 1962, by States

(Thousand cubic feet)

State	Used by producers—					
	Under boilers, etc.			In steel or allied plants		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	11, 502, 630	$1, 599, 597	$0. 139	14, 183, 896	$2, 041, 526	$0. 144
California, Colorado, and Utah	(1)	(1)	(1)	(1)	(1)	(1)
Connecticut, Maryland, New Jersey, and New York	(1)	(1)	(1)	55, 179, 877	17, 219, 209	. 312
Illinois	(1)	(1)	(1)	13, 032, 216	2, 292, 065	. 176
Indiana	5, 829, 634	1, 181, 106	. 203	56, 759, 367	10, 924, 820	. 192
Kentucky, Missouri, Tennessee, and Texas	4, 935, 212	618, 010	. 125	(1)	(1)	(1)
Michigan	(1)	(1)	(1)	28, 772, 293	6, 089, 038	. 212
Minnesota and Wisconsin	(1)	(1)	(1)	(1)	(1)	(1)
Ohio	10, 511, 020	2, 693, 736	. 256	44, 453, 111	11, 677, 806	. 263
Pennsylvania	18, 460, 296	3, 731, 043	. 202	103, 217, 802	22, 139, 321	. 214
West Virginia	(1)	(1)	(1)	(1)	(1)	(1)
Undistributed	22, 155, 900	4, 874, 035	. 220	47, 488, 332	10, 866, 600	. 229
Total 1962	73, 394, 692	14, 697, 527	. 200	363, 086, 894	83, 250, 385	. 229
At merchant plants	6, 559, 329	1, 112, 502	. 170	3, 197, 061	737, 435	. 231
At furnace plants	66, 835, 363	13, 585, 025	. 203	359, 889, 833	82, 512, 950	. 229
Total 1961	59, 525, 177	11, 553, 102	. 194	386, 602, 775	89, 094, 589	. 230

State	Sold					
	Distributed through city mains			For industrial use		
	Quantity	Value		Quantity	Value	
		Total	Average		Total	Average
Alabama	(1)	(1)	(1)	(1)	(1)	(1)
California, Colorado, and Utah	--------	--------	--------	(1)	(1)	(1)
Connecticut, Maryland, New Jersey, and New York	14, 984, 075	$7, 258, 792	$0. 484	(1)	(1)	(1)
Illinois	--------	--------	--------	(1)	(1)	(1)
Indiana	(1)	(1)	(1)	(1)	(1)	(1)
Kentucky, Missouri, Tennessee, and Texas	(1)	(1)	(1)	(1)	(1)	(1)
Michigan	--------	--------	--------	(1)	(1)	(1)
Minnesota and Wisconsin	(1)	(1)	(1)	(1)	(1)	(1)
Ohio	--------	--------	--------	6, 350, 005	$1, 221, 646	$0. 192
Pennsylvania	(1)	(1)	(1)	(1)	(1)	(1)
West Virginia	--------	--------	--------	(1)	(1)	(1)
Undistributed	7, 715, 425	2, 488, 482	. 323	18, 347, 697	3, 080, 337	. 168
Total 1962	22, 699, 500	9, 747, 274	. 429	24, 697, 702	4, 301, 983	. 174
At merchant plants	15, 057, 185	7, 115, 161	. 473	13, 586, 303	2, 560, 491	. 188
At furnace plants	7, 642, 315	2, 632, 113	. 344	11, 111, 399	1, 741, 492	. 157
Total 1961	23, 894, 346	10, 102, 971	. 423	19, 958, 042	3, 548, 034	. 178

[1] Included with "Undistributed" to avoid disclosing individual company data.

the 20th century. The early tar-processing or refining plants were operated independently of the coke ovens, although many were located near the ovens to be close to the source of supply. Several coke-oven operators started processing part of their tar in the late 1920's. This practice expanded in subsequent years as more of the producing plants installed tar-processing equipment. In the coke

TABLE 49.—Coke-oven gas and other gases used in heating coke ovens in the United States in 1962, by States [1]

(Thousand cubic feet)

State	Coke-oven gas	Producer gas	Blast-furnace gas	Natural gas	Other gases [2]	Total coke-oven gas equivalent
Alabama	25,848,735	------	------	3,778	------	25,852,513
California, Colorado, and Utah	13,820,934	------	5,580,271	33,521	754,341	20,189,067
Connecticut, Maryland, New Jersey, and New York	30,589,290	1,559,854	6,632,054	1,282,045	------	40,063,243
Illinois	8,641,976	------	4,756,518	92,280	------	13,490,774
Indiana	37,287,038	------	6,343,388	601,212	------	44,231,638
Kentucky, Missouri, Tennessee, and Texas	11,831,449	------	------	------	------	11,831,449
Michigan	7,878,664	------	11,941,874	------	------	19,820,538
Minnesota and Wisconsin	5,019,301	------	------	------	------	5,019,301
Ohio	36,143,295	------	5,060,734	------	------	41,204,029
Pennsylvania	81,837,296	------	2,078,152	697,313	------	84,612,761
West Virginia	12,404,141	------	5,426,152	------	------	17,830,293
Total 1962	271,302,119	1,559,854	47,819,143	2,710,149	754,341	324,145,606
At merchant plants	31,720,166	1,559,854	------	957,887	------	34,237,907
At furnace plants	239,581,953	------	47,819,143	1,752,262	754,341	289,907,699
Total 1961	276,673,792	2,060,314	56,054,303	11,008,118	------	345,796,527

[1] Adjusted to an equivalent of 550 Btu per cubic foot.
[2] Hydrogen-free coke-oven gas (spillage gas).

industry most of the tar processed is only partially refined or topped, mainly by furnace plants. Topping primarily strips from the crude tar the low-boiling fraction consisting principally of tar acids, bases, and naphthalene. This distillate, known as tar-acid oil or crude chemical oil, is sold to tar refiners for further processing. The residual tar or soft pitch is generally used by the producers as fuel. In 1962, 72 percent of the tar processed by coke-oven plants was topped, and the balance (28 percent) was distilled at higher temperatures to produce creosote oil and hard pitch.

The principal tar products produced at coke plants are crude chemical oil, creosote oil, naphthalene, and pitch. Other tar derivatives are phenol, cresylic acid, and various grades of cresols. Not enough companies report production of phenol, cresylic acid, cresols, and creosote oil to permit publication of statistics on these products. Also, statistics on naphthalene production cannot be published by grades because the figures would disclose individual company data. Accordingly, these data collected by the Bureau of Mines are transmitted to the U.S. Tariff Commission. This agency combines these data with similar data collected by the Commission from tar distillers and petroleum refiners and publishes a combined total in its monthly and annual reports on synthetic organic chemicals.

Production of crude chemical oil, a tar product on which statistics can be shown by the Bureau of Mines increased 28 percent, mainly because of Bethlehem Steel Co.'s new tar-processing plant at Sparrows Point, Md. The selling price, or average value per gallon, on crude chemical oil dropped 11 percent, or $0.026 per gallon. Production of pitch, however, decreased 6 percent. The average price of soft pitch decreased 14 percent, while medium pitch increased 8 percent and hard pitch advanced 7 percent. Coal tar pitch is used in a number of industrial applications, such as binder material in carbon electrodes, protective coatings (pipe enamel), roofing material, road construction and maintenance, and pitch-fibre-pipe manufacture. Pitch is also used in the manufacture of pitch coke and for making various other products, such as core binders (sand-core binders for castings), target pitch (clay pigeons), and specialty castings and sealers.

TABLE 50.—Coke-oven tar produced in the United States, used by producers, and sold in 1962, by States

(Gallons)

State	Produced		Used by producers—		
	Total	Per ton of coal coked	For refining or topping [1]	As fuel	Otherwise
Alabama	40, 774, 157	7. 18	14, 778, 987	335, 311	17, 137
California, Colorado, and Utah	38, 851, 368	10. 14	5, 693, 290	13, 019, 908	26, 510
Connecticut, Maryland, New Jersey, and New York	88, 106, 203	9. 43	68, 079, 135	3, 508, 386	40, 925
Illinois	21, 285, 528	7. 48	----------	----------	----------
Indiana	82, 471, 972	8. 16	39, 748, 884	3, 821, 411	----------
Kentucky, Missouri, Tennessee, and Texas	18, 433, 798	7. 37	----------	----------	19, 075
Michigan	32, 344, 381	7. 45	----------	----------	8, 250
Minnesota and Wisconsin	6, 431, 883	6. 44	----------	----------	5, 200
Ohio	85, 416, 395	8. 72	9, 650, 079	14, 714, 435	97, 246
Pennsylvania	195, 582, 254	9. 77	130, 257, 076	10, 973, 757	326, 902
West Virginia	40, 413, 763	10. 43	37, 929, 530	----------	----------
Total 1962	650, 111, 702	8. 86	306, 136, 981	46, 373, 208	541, 245
At merchant plants	51, 384, 647	6. 73	760, 677	----------	----------
At furnace plants	598, 727, 055	9. 11	305, 376, 304	46, 373, 208	541, 245
Total 1961	633, 377, 790	8. 71	276, 964, 564	16, 809, 902	938, 699

State	Sold for refining into tar products [2]			On hand Dec. 31
	Quantity	Value		
		Total	Average	
Alabama	24, 831, 889	$3, 122, 294	$0. 126	3, 437, 534
California, Colorado, and Utah	19, 782, 353	2, 501, 676	. 126	1, 973, 008
Connecticut, Maryland, New Jersey, and New York	17, 140, 270	2, 008, 556	. 117	4, 331, 412
Illinois	21, 998, 607	2, 831, 172	. 129	814, 515
Indiana	39, 659, 007	4, 883, 981	. 123	3, 756, 275
Kentucky, Missouri, Tennessee, and Texas	18, 424, 303	2, 251, 228	. 122	330, 211
Michigan	32, 792, 134	4, 030, 084	. 123	2, 044, 786
Minnesota and Wisconsin	(3)	(3)	(3)	870, 591
Ohio	63, 369, 674	7, 543, 472	. 119	4, 359, 980
Pennsylvania	56, 945, 282	6, 420, 990	. 113	11, 413, 295
West Virginia	(3)	(3)	(3)	1, 164, 418
Undistributed	8, 942, 231	1, 052, 865	. 118	----------
Total 1962	303, 885, 750	36, 646, 318	. 121	34, 496, 025
At merchant plants	50, 547, 209	6, 127, 521	. 121	2, 615, 981
At furnace plants	253, 338. 541	30, 518, 797	. 120	31, 880, 044
Total 1961	326, 624, 206	41, 621, 671	. 127	38, 991, 923

[1] Includes 993,142 gallons also included with "Sold for refining into tar products."

[2] Comprises 27,821,730 gallons valued at $3,351,166 sold to affiliated companies and 276,064,020 gallons valued at $33,295,152 sold to other purchasers. Also includes small amount exported.

[3] Included with "Undistributed" to avoid disclosing individual company data.

COKE-OVEN AMMONIA

In high-temperature carbonization of bituminous coal in slot ovens, a portion of the nitrogen in the coal is volatilized to form ammonia. This is recovered as an aqueous solution (ammonia liquor) or as a crystallized solid (ammonium sulfate or diammonium phosphate). In 1962, 172,888 tons of ammonia was recovered from coking operations of which 87 percent was converted into ammonium sulfate, 5 percent into diammonium phosphate, and 8 percent into ammonia liquor. The total production of ammonia from coal carbonization was only about 3 percent of the ammonia produced by all processors in the United States. Yields of ammonia depend to a large degree on the temperatures employed during carbonization. For example, at low temperatures (below 500° C) little, if any, of the nitrogen in the coal is released. However, at the prevailing temperatures used during the past several decades, ammonia yields have not varied greatly. These were probably somewhat below maximum yields that could have been obtained if the ovens had been operated primarily for ammonia recovery. Only about one-fifth of the nitrogen content of the coal is recovered as ammonia in one form or the other. Also, the decline in prices of coke-oven ammonia products in recent years reduced financial returns for this product, which hindered modernization of old and development of new improved recovery facilities.

Virtually all of the ammonium sulfate and diammonium and monoammonium phosphate produced at coke plants is used for agricultural purposes. Some of the ammonia liquor is also used in agriculture and some in industrial applications, such as the manufacture of soda ash, ammonium chloride, sulfuric acid, and household ammonia. The exact proportions consumed for agriculture and for industry are not known because the Bureau of Mines does not collect these data in such detail.

The major portion of the coke-oven ammonium sulfate marketed in 1962 was sold to consumers in the United States. Although exports of ammonium sulfate have been substantial in recent years, only about one-sixth of the 538,514 short tons exported originated at coke plants. According to data submitted by coke producers on their export sales of sulfate in 1962, the average price per ton for the coke-oven material was about $10 less than the average value of the total exports. For example, the average price per ton on all ammonium sulfate exported in 1962 was $30.79, whereas the coke-oven materials averaged only $20.71. This price was also considerably below the price received by coke-plant operators on sales for consumption within the United States, which averaged $27.47 per ton. Thus, the average price per ton of all total sales averaged $26.56, compared with $30.14 in 1961. The average prices of ammonia liquor and diammonium phosphate (including monoammonium phosphate in 1962) were 6 and 9 percent lower, respectively, than in 1961. Table 51 shows the production and sales of ammonia products by States in 1962.

CRUDE LIGHT OIL AND DERIVATIVES

Production of crude light oil in 1962 was 1 percent less than in 1961 and 30 percent less than the alltime high of 1957. All but a small proportion of the light oil recovered at coke plants was obtained from the gas stream. A negligible quantity was recovered at several tar-processing plants and was included with the light oil recovered from the gas. The recovery of crude light oil was widespread, as

TABLE 51.—Coke-oven ammonia produced in the United States and sold in 1962, by States

(Short tons)

State	Active plants [1]	Produced			
		Sulfate equivalent	Pounds per ton of coal coked	As sulfate [2]	As liquor (NH_3 content)
Alabama	7	58,971	20.76	58,354	(3)
California, Colorado, and Utah [4]	4	42,898	22.39	42,898	----------
Connecticut, Maryland, New Jersey, and New York [5]	6	77,216	16.53	71,937	(3)
Illinois	4	28,537	20.83	28,537	----------
Indiana	5	80,717	15.97	69,452	(3)
Kentucky, Tennessee, and Texas	3	18,333	19.16	(3)	(3)
Michigan [4]	4	33,242	15.32	(3)	(3)
Minnesota and Wisconsin	2	4,284	10.94	(3)	(3)
Ohio	11	87,783	18.92	74,455	(3)
Pennsylvania	12	199,358	19.91	199,358	----------
West Virginia	3	39,291	20.28	39,291	----------
Undistributed	----------	----------	----------	33,683	13,577
Total 1962	61	670,630	18.65	617,965	13,577
At merchant plants	14	69,406	19.44	27,176	10,887
At furnace plants	47	601,224	18.56	590,789	2,690
Total 1961	63	693,064	19.42	641,229	13,363

State	Sold [6]				On hand Dec. 31	
	As sulfate [2]		As liquor (NH_3 content)		Sulfate [2]	Liquor (NH_3 content)
	Quantity	Value	Quantity	Value		
Alabama	60,302	$1,890,744	(3)	(3)	17,293	34
California, Colorado, and Utah [4]	41,274	1,986,086	----------	----------	8,275	----------
Connecticut, Maryland, New Jersey, and New York [5]	71,629	2,334,154	(3)	(3)	12,771	48
Illinois	31,330	920,883	----------	----------	2,221	----------
Indiana	86,263	2,411,098	(3)	(3)	17,354	88
Kentucky, Tennessee, and Texas	(3)	(3)	(3)	(3)	690	313
Michigan [4]	(3)	(3)	(3)	(3)	5,605	61
Minnesota and Wisconsin	(3)	(3)	(3)	(3)	397	45
Ohio	85,414	2,414,868	(3)	(3)	14,797	615
Pennsylvania	231,127	5,302,175	----------	----------	35,451	----------
West Virginia	40,963	995,079	----------	----------	5,489	----------
Undistributed	35,484	1,810,228	12,897	$927,152	----------	----------
Total 1962	[7] 683,786	20,065,315	12,897	927,152	120,343	1,204
At merchant plants	27,236	1,217,818	9,620	737,034	6,015	1,122
At furnace plants	656,550	18,847,497	3,277	190,118	114,328	82
Total 1961	592,152	22,214,708	10,938	833,451	199,292	1,854

[1] Number of plants that recovered ammonia.
[2] Includes diammonium and monoammonium phosphate.
[3] Included with "Undistributed" to avoid disclosing individual company data.
[4] Figures include diammonium phosphate.
[5] Figures include monoammonium phosphate.
[6] Includes 89,547 tons of ammonium sulfate and diammonium phosphate valued at $1,874,118 exported.
[7] Comprises 657,795 tons of ammonium sulfate valued at $17,468,019 and 25,991 tons of diammonium and monoammonium phosphate valued at $2,597,296.

all but five of the active coke plants reported production. A significant development in connection with the processing of crude light oil was the substantial increase in sales to processors outside the coke industry. For many years, approximately 95 percent of the light oil recovered at coke plants was processed into benzene, toluene, xylene, and solvent naphtha, by the producing companies in integrated facilities. In 1962, however, sales of crude light oil rose to 13 percent of the output, the highest proportion on record. Further, a substantial amount of the sales of crude light oil was sold to petroleum-refining companies for processing in their facilities. In such cases, no distinction was made for the coal-derived material, and it was marketed with benzene made from petroleum fractions. Obviously, a major factor in the sharp rise in sales of crude light oil by the producing companies was the inability of some of the coke-oven operators to produce benzene that would meet exacting specifications for several applications in existing equipment.

In processing crude light oil, roughly 80 to 85 percent is recovered as salable products. As shown in table 53, yields of benzene amount to 61.4 percent; toluene, 14.4 percent; xylene, 4 percent; solvent naphtha, 2.3 percent; and other products, 2.2 percent. Benzene, the principal light-oil derivative, is used as a starting raw material for making intermediate organic chemicals such as phenol, styrene, and aniline, which in turn are used in the manufacture of synthetic fibers, synthetic rubber, plastic materials, explosives, dyes, pharmaceuticals, and many other finished chemicals or end products. For a number of years, the Coal-Chemicals Committee of the American Coke and Coal Chemicals Institute has prepared and published estimates on the end uses of benzene. Their latest estimates covering 1961 and 1962 are shown in table 57.

Although coke-oven light oil was the principal source of benzene in the United States until 1950, this source supplied only 21 percent of the benzene output in 1962. Table 56 shows the production of benzene according to industry grouping. As noted previously, an indeterminate amount of coal-derived benzene is included in the total reported under production by petroleum refiners.

Of significance in the marketing of benzene was the sharp reduction in prices. The first major price break of 1962 occurred in January, with quoted prices dropping $0.03 per gallon to $0.28. In March, prices dropped another $0.03 per gallon to $0.25. Prices stabilized at the latter figure, however, as petroleum refiners cut back production schedules and output of coal-derived material declined slightly during the summer and fall because of slackened steel production rate. Price reductions were also made on toluene and xylene. The average price per gallon on benzene and toluene in 1962, as reported by coke-oven operators to the Bureau of Mines, was slightly below price quotations published in the various trade journals. Also, according to data published by the U.S. Tariff Commission, average prices received by petroleum refiners were $0.02 per gallon higher on benzene but $0.01 lower on toluene and $0. 03 lower on xylene.

TABLE 52.—Coke-oven crude light oil produced in the United States and derived products produced and sold in 1962, by States

(Gallons)

State	Active plants[1]	Crude light oil				Derived products		
		Produced	Per ton of coal coked	Refined on premises[2]	On hand Dec. 31	Produced	Sold[3]	
							Quantity	Value
Alabama	7	13,578,149	2.39	13,263,626	512,581	10,164,154	9,919,310	$2,261,054
California, Colorado, and Utah	4	12,766,966	3.33	12,747,809	153,400	11,308,227	12,348,289	2,636,194
Connecticut, Maryland, New Jersey, and New York	6	29,816,061	3.19	31,508,283	628,749	24,980,430	25,928,829	5,811,746
Illinois	4	7,913,825	2.89	5,564,242	148,482	4,323,584	4,424,342	999,349
Indiana	4	27,513,041	2.86.	26,913,230	117,669	22,859,516	22,251,096	4,927,863
Kentucky, Missouri, Tennessee, and Texas	5	6,530,081	2.61	3,373,263	155,525	2,790.946	2,505,358	559,164
Michigan and Wisconsin	5	12,836,679	2.72	7,981,405	405,567	6,482,551	6,451,642	1,459,184
Ohio	11	26,800,087	2.80	19,494,901	437,553	17,038,586	16,727,700	3,636,705
Pennsylvania	12	62,342,390	3.11	56,770,412	2,226,471	49,175,684	49,191,831	11,603,342
West Virginia	3	11,590,660	2.99	11,335,192	47,470	10,215,168	9,947.895	2,107,482
Total 1962	61	211,687,939	2.94	188,952,363	4,833,467	159,338,846	159,696,292	36,002,083
At merchant plants	13	15,812,111	2.40	11,645,812	906,607	9,470,273	9,504,955	2,125,978
At furnace plants	48	195,875,828	3.00	177.306,551	3,926,860	149,868,573	150,191,337	33,876,105
Total 1961	64	214,002,542	3.00	198,580,921	3,989,800	165,231,421	154,858,909	44,146,985

[1] Number of plants that recovered crude light oil.
[2] Includes small quantity of material also reported in sales of crude light oil in table 43.
[3] Excludes 27,017,854 gallons of crude light oil valued at $3,401,068 sold as such.

TABLE 53.—Yield of light-oil products from refining crude light oil at oven-coke plants in the United States

(Percent)

Year	Benzene		Toluene (all grades)	Xylene (all grades)	Solvent naphtha (crude and refined)	Other light-oil products
	Motor	All other grades				
1929	54.4	12.8	9.4	(1)	3.7	3.4
1939	48.6	15.4	12.1	2.5	2.9	3.8
1949	9.5	55.6	12.5	3.3	2.3	3.2
1957–59 (average)	.5	60.4	13.5	3.9	2.1	2.3
1960	.4	62.0	13.9	3.7	2.1	1.7
1961	.5	60.5	14.3	3.8	2.3	1.8
1962	.9	60.5	14.4	4.0	2.3	2.2

[1] Included with "Solvent naphtha (crude and refined)."

TABLE 54.—Light-oil derivatives produced at oven-coke plants in the United States and sold in 1962, by States

(Gallons)

State	Benzene (all grades except motor)				Toluene (all grades)			
	Produced	Yield from crude light oil refined (percent)	Sold[1]		Produced	Yield from crude light oil refined (percent)	Sold	
			Quantity	Value			Quantity	Value
Alabama	7,624,885	57.5	7,596,161	$1,772,730	1,742,052	13.1	1,589,110	$316,482
California, Colorado, and Utah	7,812,276	61.3	8,807,993	1,816,591	1,522,256	11.9	1,523,950	333,919
Illinois	3,289,009	59.1	3,368,915	779,143	743,199	13.4	751,377	160,055
Indiana	18,278,085	67.9	17,491,324	3,944,485	3,344,623	12.4	3,639,476	728,798
Maryland and New York	17,544,227	55.7	18,578,022	4,388,329	5,176,396	16.4	5,185,987	956,019
Michigan and Wisconsin	5,078,557	63.6	4,958,696	1,163,889	906,336	11.4	1,028,118	215,752
Missouri, Tennessee, and Texas	2,126,527	63.0	2,027,745	463,794	400,689	11.9	312,615	61,699
Ohio	12,434,727	63.8	12,402,188	2,712,213	2,812,396	14.4	2,780,334	616,603
Pennsylvania	32,892,301	57.9	34,275,537	8,322,830	8,545,043	15.1	8,548,963	1,790,963
West Virginia	7,146,589	63.0	6,902,924	1,507,595	2,037,744	18.0	2,013,836	398,056
Total 1962	114,227,183	60.5	116,409,505	26,871,599	27,230,734	14.4	27,373,766	5,578,346
At merchant plants	6,490,711	55.7	6,630,452	1,556,306	1,729,051	14.8	1,699,259	371,451
At furnace plants	107,736,472	60.8	109,779,053	25,315,293	25,501,683	14.4	25,674,507	5,206,895
Total 1961	120,205,300	60.5	113,271,937	34,773,585	28,406,752	14.3	27,420,529	5,937,794

State	Xylene (all grades)				Solvent naphtha (crude and refined)			
	Produced	Yield from crude light oil refined (percent)	Sold		Produced	Yield from crude light oil refined (percent)	Sold	
			Quantity	Value			Quantity	Value
Alabama	489,749	3.7	472,958	$126,306	138,994	1.0	189,158	$35,888
California, Colorado, and Utah	318,031	2.5	345,414	87,249	733,456	5.8	748,724	186,328
Illinois	143,760	2.6	156,434	37,916	(2)	(2)	(2)	(2)
Indiana	336,203	1.2	352,478	90,689	586,818	1.8	596,952	149,754
Maryland and New York	1,468,712	4.7	1,375,576	352,778	(3)	(3)	(3)	(3)
Michigan and Wisconsin	227,931	2.9	205,352	49,749	(2)	(2)	---	---
Missouri, Tennessee, and Texas	190,978	5.7	110,334	27,111	(4)	(4)	(4)	(4)
Ohio	694,794	3.6	671,253	173,751	484,060	2.5	463,110	100,833
Pennsylvania	3,038,864	5.4	2,842,845	730,557	2,180,857	3.0	2,159,887	553,276
West Virginia	668,861	5.9	664,262	154,982	159,810	1.1	146,621	16,697
Total 1962	7,577,883	4.0	7,196,906	1,831,088	4,283,995	2.3	4,304,452	1,042,776
At merchant plants	438,709	3.8	388,622	104,328	45,528	.4	36,390	9,214
At furnace plants	7,139,174	4.0	6,808,284	1,726,760	4,238,467	2.4	4,268,062	1,033,562
Total 1961	7,563,945	3.8	7,280,896	1,922,198	4,515,937	2.3	4,384,198	1,105,838

---

[1] Includes small amount exported.

[2] Included with Indiana.

[3] Included with Pennsylvania.

[4] Included with West Virginia.

TABLE 55.—Benzene and toluene produced at oven-coke plants in the United States, by grades

(Gallons)

Year	Benzene				Toluene		
	Motor	Nitration (1° C)	Industrial (2° C)	All other	Nitration (1° C)	Industrial (2° C)	All other
1941	106,372,000	15,414,500	18,286,400	4,182,600	14,689,800	13,268,500	1,378,900
1949	20,923,700	28,988,700	91,717,300	2,035,600	20,808,300	6,317,200	545,100
1957–59 (average)	1,240,500	83,881,700	50,045,700	5,193,600	24,810,700	6,196,400	(1)
1960	769,900	100,907,000	32,536,800	1,882,600	24,129,300	6,269,200	(1)
1961	1,027,400	85,648,800	33,111,900	1,444,600	22,820,100	5,586,700	(1)
1962	1,786,200	81,831,600	32,062,800	332,800	22,140,900	5,089,800	(1)

[1] Included with "Industrial (2° C)" to avoid disclosing individual company data.

TABLE 56.—Production of benzene (excluding motor grade) in the United States [1]

(Thousand gallons)

Year	From tar distilleries [2]					From coke-oven operations				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				1,000 dollars	Average per gallon				1,000 dollars	Average per gallon
1957–59 (average)	27,130	8.4	16,948	$6,377	$0.38	189,121	43.2	138,058	$43,924	$0.32
1960	12,787	2.8	635	187	.29	135,326	29.6	137,784	44,167	.32
1961	12,355	2.3	(3)	(3)	(3)	120,205	22.0	113,272	34,774	.31
1962	14,039	2.6	(3)	(3)	(3)	114,227	20.9	116,410	26,872	.23

Year	From petroleum refineries					Total				
	Produced	Percent of total	Sold			Produced	Percent of total	Sold		
			Quantity	Value				Quantity	Value	
				1,000 dollars	Average per gallon				1,000 dollars	Average per gallon
1957–59 (average)	155,694	48.4	128,417	$40,864	$0.32	321,945	100.0	283,423	$91,165	$0.32
1960	309,210	67.6	239,008	73,209	.31	457,323	100.0	377,427	117,563	.31
1961	412,819	75.7	307,739	99,348	.32	545,379	100.0	421,011	134,122	.32
1962	418,131	76.5	288,297	72,614	.25	546,397	100.0	404,707	99,486	.25

[1] U.S. Tariff Commission.

[2] Includes benzene made from imported crude light oil.

[3] Not available.

TABLE 57.—Estimated consumption of commercial benzene (excluding motor grade) in the United States, by uses [1]

(Thousand gallons)

Use	1957-59 (average)	1960	1961	1962
Styrene	160,000	210,000	210,000	217,000
Phenol (synthetic)	74,000	100,000	100,000	104,000
Dodecyl benzene	36,000	37,000	37,000	40,000
Cyclohexane	30,000	40,000	55,000	65,000
Aniline	14,000	15,000	16,000	17,000
DDT	14,000	16,000	16,000	16,000
Dichlorobenzene and monochlorobenzene	11,000	15,000	15,000	16,000
Maleic anhydride	9,000	17,000	14,000	14,000
Benzene hexachloride	3,000	3,000	2,000	1,000
Diphenyls	4,500	4,500	5,000	5,000
Nitrobenzene	2,000	2,000	2,000	2,000
Miscellaneous	21,500	9,000	9,000	17,000
Exported	7,000	23,500	46,000	35,000
Total	386,000	492,000	527,000	549,000

[1] Coal-Chemicals Committee, American Coke and Coal-Chemicals Institute, Washington, D.C.

Fuel Briquets and Packaged Fuel

By Eugene T. Sheridan[1] and Maxine M. Otero[2]

⁂

CONTENTS

	Page		Page
General summary	273	Fuel briquets—Continued	
Scope of report	276	Technology	284
Fuel briquets	277	Packaged fuel	285
Capacity	277	Capacity	285
Production	278	Production	286
Raw materials	279	Raw materials	287
Shipments	281	Shipments	288
Value and price	282	Value and price	288
Foreign trade	282	World review	289

GENERAL SUMMARY

THE DOWNWARD trend in production of fuel briquets and packaged fuel continued in 1962, but the combined output of both fuels was only slightly less than in 1961. Fuel-briquet production dropped 2,241 tons, a decrease of less than 1 percent; packaged-fuel output declined 1,741 tons, a 9-percent decrease.

Eleven plants with a total maximum productive capacity of 2.3 million tons produced 570,000 tons of fuel briquets. Fifteen plants with a combined maximum productive capacity of 113,000 tons produced 17,000 tons of packaged fuel. All plants in both industries operated at greatly reduced rates.

Nearly one-half of the total briquets was produced in Wisconsin; the remainder was produced chiefly in West Virginia and Michigan. Packaged fuel was produced principally in Michigan and Wisconsin.

The total value of shipments was approximately $9 million—$8.6 million for briquets and $0.4 million for packaged fuel. Virtually the entire output of both industries was sold in the year of production.

Foreign trade was insignificant; only 19,000 tons of briquets was exported and only 8,000 tons was imported. Both exports and imports, however, were greater than in 1961. There was no foreign trade in packaged fuel.

---

[1] Supervisory mineral specialist.
[2] Supervisory statistical assistant.

TABLE 1.—Salient fuel-briquetting and packaged-fuel statistics

	1957–59 (average)	1960	1961	1962
Fuel briquets:				
United States:				
Production ________ short tons__	1,002,054	744,385	572,264	570,023
Shipments [1] ________ do____	999,444	744,934	567,779	569,913
Value of shipments ________	$13,471,783	$10,439,097	$7,956,102	$8,597,021
Average per ton, f.o.b. plant ________	$13.48	$14.01	$14.01	$15.08
Imports ________ short tons__	406	[2] 5,529	7,338	8,396
Exports ________ do____	58,294	21,126	12,731	18,596
Consumption, apparent [3] ________ do____	[2] 941,556	[2] 729,337	[2] 562,386	559,713
World production ________ do____	117,800,000	[2] 119,200,000	[2] 123,100,000	127,800,000
Packaged fuel:				
United States:				
Production ________ do____	38,923	24,706	19,180	17,439
Shipments ________ do____	38,432	24,940	19,005	17,259
Value of shipments ________	$868,112	$584,956	$441,497	$394,065
Average per ton, f.o.b. plant ________	$22.59	$23.45	$23.23	$22.83

[1] Includes briquets used by producers.

[2] Revised figure.

[3] Shipments plus imports minus exports. Import and export data do not include briquets made from petroleum products.

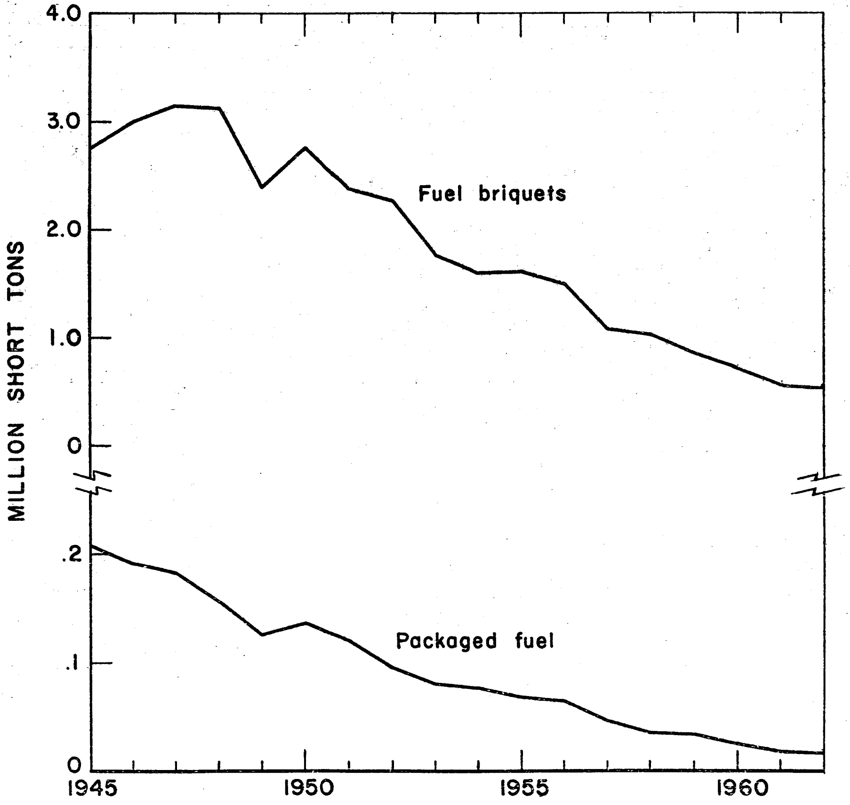


FIGURE 1.—Production of fuel briquets and packaged fuel in the United States, 1945–62.

TABLE 2.—Historical statistics of the fuel-briquet industry in the United States

Year	Number of plants	Production (short tons)	Value		Imports (short tons)	Exports (short tons)
			Total	Per ton		
1907	11	66,524	$258,426	$3.88	(1)	(1)
1908	8	90,358	323,057	3.58	(1)	(1)
1909	16	139,661	452,697	3.24	(1)	(1)
1910	(2)	(2)	(2)	(2)	(1)	(1)
1911	21	218,443	808,721	3.70	(1)	(1)
1912	19	220,064	952,261	4.33	(1)	(1)
1913	17	181,859	1,007,327	5.54	(1)	(1)
1914	16	250,635	1,154,678	4.61	(1)	(1)
1915	15	221,537	1,035,716	4.68	(1)	(1)
1916	15	295,155	1,445,662	4.90	(1)	(1)
1917	13	406,856	2,233,888	5.49	(1)	(1)
1918	12	477,235	3,212,793	6.73	(1)	(1)
1919	12	295,734	2,301,054	7.78	136	(1)
1920	15	567,192	4,623,831	8.15	----------	(1)
1921	15	398,949	3,632,301	9.10	66	(1)
1922	14	619,425	5,444,926	8.79	34,862	(1)
1923	14	696,810	5,898,698	8.47	19,559	(1)
1924	12	580,470	4,986,622	8.59	38	(1)
1925	17	839,370	7,128,404	8.49	6,758	(1)
1926	19	995,332	8,533,179	8.57	123,593	(1)
1927	19	970,468	7,985,165	8.23	60,601	(1)
1928	21	947,423	7,705,617	8.13	71,485	(1)
1929	25	1,212,415	9,515,205	7.85	89,458	(1)
1930	25	1,028,865	8,028,736	7.80	73,418	(1)
1931	27	698,316	5,260,585	7.53	60,950	(1)
1932	26	470,604	3,458,663	7.35	80,288	(1)
1933	27	530,430	3,498,280	6.60	42,395	(1)
1934	27	704,856	4,276,466	6.07	----------	(1)
1935	29	860,707	5,376,128	6.25	16,779	(1)
1936	32	1,124,973	7,043,133	6.26	20,350	(1)
1937	31	995,930	6,393,723	6.42	6,674	25,350
1938	35	871,260	5,701,890	6.54	13,814	16,692
1939	31	892,213	5,801,666	6.50	1,344	12,576
1940	32	1,050,870	6,438,952	6.13	----------	23,285
1941	32	1,298,606	8,001,829	6.16	162	46,477
1942	30	1,748,300	11,266,041	6.44	334	103,921
1943	28	2,163,998	15,148,109	7.00	198	174,798
1944	30	2,464,961	18,434,579	7.48	538	163,672
1945	32	2,762,204	21,678,886	7.85	722	169,360
1946	35	3,004,027	25,299,612	9.75	653	163,339
1947	35	3,171,596	30,762,253	9.70	387	248,760
1948	36	3,128,477	36,011,322	11.51	329	207,885
1949	33	2,403,971	28,641,424	11.91	365	167,140
1950	31	2,770,020	32,039,379	11.57	804	175,768
1951	28	2,387,219	27,454,638	11.50	123	168,780
1952	28	2,279,756	26,743,120	11.73	168	132,786
1953	26	1,780,061	21,111,293	11.86	97	102,907
1954	25	1,624,462	19,161,635	11.80	239	98,908
1955	23	1,629,542	19,037,987	11.68	----------	106,294
1956	21	1,518,540	18,221,686	12.00	318	107,452
1957	17	1,104,781	14,802,033	13.40	850	86,464
1958	16	1,035,261	13,697,169	13.23	184	54,961
1959	15	866,120	12,026,319	13.89	185	33,458
1960	14	744,385	10,429,809	14.01	5,529	21,126
1961	12	572,264	8,023,169	14.02	7,338	12,731
1962	11	570,023	[3] 8,597,021	15.08	8,396	18,596

[1] Not available.
[2] No canvass.
[3] Value of shipments.

TABLE 3.—Historical statistics of the packaged-fuel industry in the United States

Year	Number of plants	Production (short tons)	Value	
			Total	Per ton
1935	25	25,244	$193,874	$7.68
1936	48	66,427	505,331	7.61
1937	64	146.037	1,287.320	8.81
1938	76	160,952	1,405,253	8.73
1939	103	215,507	1,866,751	8.66
1940	106	284,513	2,391,922	8.41
1941	103	269,844	2.471.567	9.16
1942	89	253,048	2,540.087	10.04
1943	72	215,605	2,366.733	10.98
1944	68	175,770	2,053.343	11.68
1945	61	208,143	2,518,636	12.10
1946	70	190,919	2,496,388	13.08
1947	62	182,881	2,882,105	15.76
1948	62	157,013	2.735,861	17.42
1949	57	125,948	2,236,748	17.76
1950	54	135,682	2,430,847	17.92
1951	53	119,535	2,169.539	18.15
1952	43	96,267	1,780,471	18.50
1953	37	79,732	1,492,119	18.71
1954	37	77,360	1,416,606	18.31
1955	31	69.212	1,194.045	17.25
1956	26	64,960	1,381,880	21.27
1957	23	47,287	1,022,262	21.62
1958	23	35,769	828,116	23.15
1959	21	33,715	790,785	23.45
1960	19	24,706	579.217	23.44
1961	16	19,180	445,740	23.24
1962	15	17,439	[1] 394,065	22.83

[1] Value of shipments.

SCOPE OF REPORT

This report, part of an annual publication of the Bureau of Mines, is based upon data submitted voluntarily by producers of fuel briquets and packaged fuel in the United States. Similar reports on the fuel-briquet industry have been published each year since 1907, except in 1910 when no data were collected. A report on the packaged-fuel industry has been published annually since 1935.

All data, except where noted, were compiled from reports submitted by producers of briquetted mineral fuels. Charcoal briquets were excluded because they are produced from forest products and are not within the scope of the Bureau's commodity programs.

Complete coverage of both industries was attempted and all known producers were canvassed. Of the 14 fuel-briquet plants surveyed, 11 reported production, 1 was idle, and 2 were abandoned. Neither the idle nor the abandoned plants were active during 1961. One plant in Wisconsin that reported production for 1961 was abandoned and not canvassed for 1962.

Twenty-five plants were canvassed for packaged-fuel production. Of this number, 15 reported production, 4 were abandoned, and 6 did not reply. Of the plants that did not reply, only one operated in 1961, and its output was small.

Fuel briquets and packaged fuel are similar in that both are compressed mineral-fuel fines. They differ, however, in physical properties and manner of use. Briquets are usually produced in pillow-shaped form, are 2 to 4 inches in size, and are made with a water-insoluble binder. This allows them to be handled and stored as bulk fuel. Packaged fuel is produced in 3- or 4-inch cubes that are wrapped together in heavy kraft paper to form a package weighing from 10 to 15 pounds. The cubes are burned as a unit without removing the paper. Both fuels are used chiefly for residential heating. Briquets, however, are used principally as a general utility fuel, whereas packaged fuel is a specialty item, used in most areas as a supplemental fuel. Briquets are produced in relatively large plants that are usually at mines or coal-unloading docks where fine-sized fuels accumulate. Some packaged fuel is produced from fines that accumulate in fuel yards. However, most of the raw fuels used for packaged fuel is purchased.

The average of the 3-year period 1957–59 was used as a base for measuring production and consumption trends. All quantities are shown in short tons, and values assigned to shipments are based upon the average value of sales, f.o.b. plant, reported by individual producers.

Data on briquet production and shipments are shown by geographic regions, arbitrarily established, to avoid revealing individual plant data in States with a small number of producing companies. States assigned to each region were as follows: Eastern—West Virginia; Central—Indiana, Michigan, and Wisconsin; Western—Missouri and North Dakota.

Data on stocks were not collected because briquets and packaged fuel generally are sold as produced.

The term "capacity" in this report refers to the total maximum quantity of fuel that each industry could produce if all active plants, working their regular number of shifts each day but allowing for unavoidable shutdowns operated at a maximum rate for a year. The capacities shown include only the plants that reported production for 1962. These plants, however, account for virtually the entire capacity of the industries.

The terms "consumption" and "distribution" are used synonymously because it was assumed that, except for the briquets exported, the fuels were used in the States to which they were shipped by producers.

FUEL BRIQUETS

CAPACITY

Productive capacity of the industry decreased slightly because of one less operating plant. All plants operating in 1962 were also in operation in 1961, and all maintained their former productive capacities. Virtually all, however, had less production. Plant capacities ranged from 45,000 to 600,000 tons per year. About one-fourth of the plants had capacities of less than 100,000 tons. Total capacity for the industry was 2.3 million tons. This was about three-fourths that of the base years 1957–59 and roughly half that of a decade ago.

TABLE 4.—Annual capacity and production of briquetting plants in the United States

	Active plants	Annual capacity (short tons)	Production	
			Short tons	Percent of capacity
1958	16	3,018,000	1,035,261	34.3
1959	15	2,955,500	866,120	29.3
1960	14	2,624,500	744,385	28.4
1961	12	2,344,500	572,264	24.4
1962:				
Plants with capacity of—				
Less than 25,000 tons	---	---	---	---
25,000 to less than 100,000 tons	3	160,000	37,773	23.6
100,000 to less than 200,000 tons	4	647,500	215,093	33.2
200,000 to less than 400,000 tons	1	(1)	(1)	(1)
400,000 or more tons	3	1,500,000	317,157	21.1
Total	11	2,307,500	570,023	24.7
Plants with production of—				
Less than 5,000 tons	1	(2)	(2)	(2)
5,000 to less than 10,000 tons	---	---	---	---
10,000 to less than 25,000 tons	4	360,000	79,381	22.1
25,000 to less than 100,000 tons	5	1,947,500	490,642	25.2
100,000 or more tons	1	(3)	(3)	(3)
Total	11	2,307,500	570,023	24.7

[1] Combined with "100,000 to less than 200,000 tons" to avoid disclosing individual company figures.
[2] Combined with "10,000 to less than 25,000 tons" to avoid disclosing individual company figures.
[3] Combined with "25,000 to less than 100,000 tons" to avoid disclosing individual company figures.

PRODUCTION

Briquet production decreased slightly in 1962 because two plants were abandoned and four plants reported smaller outputs than in 1961. The loss from these plants was nearly offset by the production of seven other plants that reported increased outputs. The decrease in total production continued a trend of declining output for the industry that began in 1948 as fuel oil and natural gas moved into markets that formerly were held by solid fuels. Annual output, currently, is about one-half the size of yearly output for the present base period, 1957–59, and it is only about one-fifth as large as it was during the period of peak production, 1947–49.

Eleven plants in six States reported production. Nearly-three-fourths of the total was produced in West Virginia and Wisconsin. Wisconsin had five plants, the greatest number of operations, and the largest output. All plants in Wisconsin were in the northern and Lake Dock areas. West Virginia, with one plant, was second in production. Other producing States and the number of active plants in each, in order of output were Michigan, one; Missouri, two; and North Dakota and Indiana, one each.

Because briquets are used chiefly for space heating and are sold as produced, production varied with the season, ranging from 98,000 tons in January to 9,000 tons in July.

The quantity of briquets produced and sold, the value of shipments, and the number of active plants in the United States during the past 2 years are shown in table 5. The quantity of briquets produced in each month during 1962 is shown in table 6.

TABLE 5.—Production and shipments of fuel briquets in the United States, by regions

Region	Active plants	Production (short tons)	Shipments[1]		
			Short tons	Value	
				Total	Average
1961:					
Eastern States	1	(2)	(2)	(2)	(2)
Central States	8	325,801	326,601	$5,139,584	$15.74
Western States	3	246,463	241,178	2,816,518	11.68
Total	12	572,264	567,779	7,956,102	14.01
1962:					
Eastern States	1	(2)	(2)	(2)	(2)
Central States	7	347,318	348,062	$5,448,149	$15.65
Western States	3	222,705	221,851	3,148,872	14.19
Total	11	570,023	569,913	8,597,021	15.08

[1] Includes 1,407 tons in 1961 and 1,464 tons in 1962 used by producers.
[2] Included with "Western States" to avoid disclosing individual company figures.

TABLE 6.—Production of fuel briquets in the United States in 1962, by months

Month	Short tons	Month	Short tons	Month	Short tons
January	98,014	May	26,768	September	45,853
February	60,800	June	23,654	October	75,450
March	37,901	July	9,429	November	74,596
April	21,275	August	30,407	December	65,876

RAW MATERIALS

Raw Fuels.—Briquets were manufactured from seven different mineral fuels in 1962. About two-thirds of the total raw fuel, however, was low-volatile bituminous coal. Petroleum coke accounted for 20 percent, and the remainder, in order of quantities consumed, consisted of lignite char, Pennsylvania anthracite, high-volatile bituminous coal, semianthracite, and other anthracite. All but five plants used more than one type of fuel. In most instances those using more than one type combined the different fuels to produce a composite briquet. Approximately one-fifth of the total raw fuels originated from screenings in coal yards; the remainder was supplied chiefly by mines and unloading docks.

The average value per ton at the briquet plant of all raw fuels used for briquets was $9.07. This was about four-fifths the average unit value of total raw materials.

Binders.—Thirty-nine thousand tons of binding materials was consumed in the briquetting process. All but one plant used petroleum asphalt exclusively for a binder. This plant used a mixture of petroleum asphalt and coal-tar pitch, combined in the ratio of roughly 1 to 1. Asphalt was preferred because of its good cohesive properties, insolubility in water, low-ash content, and relatively low cost.

Excluding water, binders constituted 6.7 percent of the total raw materials. The binder content of most briquets ranged from 6 to 7 percent. In addition to binders, two plants used a small quantity of oil that was sprayed on the finished briquets for dustproofing.

The average value per ton of binders (including spray oil) consumed in 1962 was $27.16. On the basis of value per unit of production, the value of the binder used to produce each ton of briquets was $1.84. This was about one-fifth the average value of the total raw materials used for producing each ton of briquets.

TABLE 7.—Raw fuels used in making fuel briquets in the United States in 1962

Type	Number of plants	Used		
		Short tons	Value	
			Total	Average
Anthracite:				
Pennsylvania	2	(1)	(1)	(1)
Other than Pennsylvania	1	(1)	(1)	(1)
Semianthracite	1	(1)	(1)	(1)
Bituminous coal:				
Low-volatile	9	372,035	$3,455,600	$9.29
High-volatile	1	(1)	(1)	(1)
Petroleum coke	6	108,548	893,482	8.23
Lignite char	1	(1)	(1)	(1)
Undistributed		60,857	562,063	9.24
Total	[2] 11	541,440	4,911,145	9.07

[1] Included with "Undistributed" to avoid disclosing individual company figures.
[2] Some plants used more than 1 type of raw fuel; hence, the number of plants exceeds the total shown.

TABLE 8.—Quantity and value of raw materials used in making fuel briquets in the United States in 1962, by regions

Region	Short tons	Value	
		Total	Average
	Fuels		
Eastern States	(1)	(1)	(1)
Central States	333,030	$3,459,926	$10.39
Western States	208,410	1,451,219	6.96
Total	541,440	4,911,145	9.07
	Binders [2]		
Eastern States	(1)	(1)	(1)
Central States	23,140	$611,565	$26.43
Western States	15,451	436,705	28.26
Total	38,591	1,048,270	27.16
	Total		
Eastern States	(1)	(1)	(1)
Central States	356,170	$4,071,491	$11.43
Western States	223,861	1,887,924	8.43
Total	580,031	5,959,415	10.27

[1] Included with "Western States" to avoid disclosing individual company figures.
[2] Includes 384 tons of spray oil used by 2 plants for dustproofing briquets.

SHIPMENTS

Briquets were distributed in 36 States and exported to 13 foreign countries. The quantities consumed in individual States varied greatly, however, ranging from 2 tons in Wyoming to 114,000 tons in Wisconsin.

About three-fourths of the briquets were consumed in seven Central and North-Central States—Indiana, Michigan, Minnesota, Missouri, North Dakota, Ohio, and Wisconsin. Wisconsin was the chief consumer, using about one-fifth of the total distributed. Virtually all briquets consumed in Wisconsin were produced within the State. In addition to supplying its own requirements, Wisconsin shipped 58 percent of its production to seven other States and Canada.

Michigan, ranking second in consumption, used all of its own output and also received briquets from three other States. Minnesota, Indiana, and Missouri followed Michigan, receiving 14, 8, and 7 percent of the total shipments. Minnesota was the largest nonproducing consumer of briquets. West Virginia, the second largest producer, shipped virtually all of its production to other States and Canada.

About three-fourths of the briquets distributed were shipped by rail. However, the mode of transportation varied somewhat with the producing region. Virtually all briquets produced in West Virginia were shipped by rail because most markets were too distant for practical delivery by truck. In the Central region about two-thirds of the shipments were by rail.

Foreign shipments by producers continued to decline. Less than 5,000 tons was exported, all to Canada. Total exports were somewhat larger, however, because export firms shipped an additional 14,000 tons to foreign countries.

Except for a small quantity packaged in bags, all briquets were shipped and sold as bulk fuel. Shipments by State of origin are not shown because of the small number of producing companies.

TABLE 9.—Destination of fuel briquets sold and used by producers [1]

(Short tons)

Destination	1961	1962	Destination	1961	1962
Arizona	---------	40	New Jersey	---------	518
California	---------	2,910	New York	---------	1,353
Colorado	---------	707	North Carolina	22,388	18,554
Connecticut	---------	244	North Dakota	30,837	31,308
District of Columbia	---------	103	Ohio	33,417	31,097
Florida	50	52	Oregon	---------	60
Idaho	---------	180	Pennsylvania	319	349
Illinois	22,775	20,773	South Carolina	700	771
Indiana	48,806	42,768	South Dakota	25,455	25,305
Iowa	18,618	19,237	Tennessee	677	606
Kansas	2,512	1,825	Utah	---------	330
Kentucky	2,618	2,660	Virginia	29,942	29,687
Maine	51	---------	Washington	937	1,915
Maryland	954	607	West Virginia	333	276
Massachusetts	265	124	Wisconsin	112,174	114,364
Michigan	87,160	98,134	Wyoming	---------	2
Minnesota	68,729	77,094			
Missouri	46,958	38,062	Total	560,617	565,238
Montana	1	189	Exported	7,162	4,675
Nebraska	3,890	2,955			
New Hampshire	51	79	Grand total	567,779	569,913

[1] Based upon reports from producers showing destination of briquets used or sold.

TABLE 10.—Shipments of fuel briquets in the United States, by method of transportation [1]

(Short tons)

Origin	1961			1962		
	Rail	Truck	Total	Rail	Truck	Total
Eastern States	(2)	(2)	(2)	(2)	(2)	(2)
Central States	224,432	101,187	325,619	233,349	113,609	346,958
Western States	195,156	45,597	240,753	182,415	39,076	221,491
Total	419,588	146,784	566,372	415,764	152,685	568,449

[1] Includes shipments destined for export as reported by producers directly to the Bureau of Mines.
[2] Included with "Western States" to avoid disclosing individual company figures.

VALUE AND PRICE

The total value of briquet shipments, based upon an average f.o.b. plant price of $15.08 per ton, was $8,597,021. Compared with 1961, the average price per ton, f.o.b. plant, increased 8 percent. Plant prices varied somewhat with the area in which briquets were produced; however, those produced in the Eastern region had the lowest unit value because they were produced at the source of the raw fuel. Markets for these briquets were more distant than for those produced in other areas, however, and transportation costs on the finished product added substantially to its selling price at the point of consumption. Briquets produced in areas remote from the source of raw fuels had higher plant values because transportation charges were reflected in the cost of raw fuels consumed. In general, briquets produced and sold in the producing area were competitively priced with those produced from low-cost fuel in areas remote from markets.

FOREIGN TRADE [3]

Foreign trade was small; only 18,596 tons was exported and 8,396 tons, imported. These tonnages include briquets made from coal and coke and other composition coals used for fuel.

Although exports were only about one-third as large as in the base years, they were about 50 percent greater than in 1961, chiefly because of increased shipments to Canada. Canada remained the principal export market, receiving 92 percent of the total shipments. About one-fourth was shipped directly by producers; the remainder, by export firms. Most of the briquets shipped to Canada were produced in Wisconsin and were exported through the Chicago, Dakota, Duluth and Superior, and Michigan customs districts. The remaining briquets were exported chiefly to the Dominican Republic and two Japanese islands. The export data in table 11 differ from those shown in table 9 in that foreign shipments by export firms are also included.

Imports increased 14 percent over those in 1961 and were about 20 times greater than in the base years. Virtually all were imported from Canada.

---

[3] Figures on imports and exports compiled by Mae B. Price and Elsie D. Jackson, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

TABLE 11.—Fuel briquets (coal and coke) exported from the United States, by countries of destination and customs districts

	1960		1961		1962	
	Short tons	Value	Short tons	Value	Short tons	Value
COUNTRY						
North America:						
Barbados	------	------	------	------	16	$232
British Honduras	------	------	19	$266	18	270
Canada	19,403	$279,458	11,063	152,791	17,028	213,314
Canal Zone	------	------	14	202	------	------
Costa Rica	------	------	------	------	85	650
Dominican Republic	------	------	111	1,574	538	5,670
Leeward and Windward Islands	------	------	------	------	19	232
Mexico	244	2,916	1,248	17,327	186	2,823
Trinidad and Tobago	457	7,240	------	------	------	------
Total	20,104	289,614	12,455	172,160	17,890	223,191
South America:						
Surinam	------	------	55	816	61	832
Venezuela	10	1,255	111	1,317	44	676
Total	10	1,255	166	2,133	105	1,508
Europe: Spain	------	------	------	------	123	1,841
Asia:						
Indonesia	------	------	24	348	------	------
Japan	393	5,291	------	------	------	------
Nansei and Nanpo Islands	------	------	------	------	403	5,690
Pakistan	258	3,281	------	------	------	------
Saudi Arabia	------	------	67	945	20	300
Thailand	20	450	------	------	------	------
Total	671	9,022	91	1,293	423	5,990
Africa:						
Congo, Republic of the, and Ruanda-Urundi[1]	341	5,524	------	------	------	------
Liberia	------	------	19	280	------	------
Western Equatorial Africa, n.e.c.	------	------	------	------	55	426
Total	341	5,524	19	280	55	426
Grand total	21,126	305,415	12,731	175,866	18,596	232,956
CUSTOMS DISTRICT						
Arizona	68	$1,026	------	------	------	------
Buffalo	2,078	29,686	946	$14,614	1,433	$19,366
Chicago	------	------	------	------	3,641	25,490
Dakota	6,680	103,175	2,883	40,777	3,622	51,676
Duluth and Superior	5,177	81,395	3,480	53,981	2,804	43,947
Florida	------	------	------	------	35	464
Galveston	278	3,731	187	2,440	------	------
Laredo	172	1,650	986	13,893	169	2,563
Maryland	------	------	------	------	61	832
Michigan	5,418	64,610	2,770	31,944	4,758	62,203
Mobile	------	------	71	1,004	538	5,670
Montana and Idaho	------	------	127	1,800	------	------
New Orleans	10	1,255	73	1,038	103	920
New York	341	5,524	210	3,046	590	8,507
Philadelphia	------	------	------	------	65	919
Sabine	------	------	------	------	55	426
St. Lawrence	------	------	724	7,790	606	8,066
San Diego	4	240	141	1,654	17	260
San Francisco	393	5,291	------	------	------	------
Vermont	50	592	------	------	45	873
Virginia	457	7,240	------	------	------	------
Washington	------	------	133	1,885	54	774
Total	21,126	305,415	12,731	175,866	18,596	232,956

[1] Belgian Congo before July 1, 1960.

Source: Bureau of the Census

The unit values of imported briquets were substantially higher than those of domestic briquets, but the values are not comparable because they were assigned at different marketing levels. Also, most of the imported briquets were packaged specialty fuels, whereas domestic briquets were sold principally as bulk fuel by the ton.

TABLE 12.—Fuel briquets (coal and coke) imported for consumption in the United States, by countries and customs districts

Country and customs district	1960		1961		1962	
	Short tons	Value	Short tons	Value	Short tons	Value
Canada:						
Buffalo			1,821	$91,877	3,166	$156,633
Dakota	1,735	$170,102	921	48,014	1,101	40,614
Duluth and Superior			187	9,341	135	6,788
Hawaii			96	3,427	162	5,581
Michigan	3	421	500	26,278	1,006	57,698
Montana and Idaho	1,533	41,348	1,477	73,758	1,341	66,081
Washington	1,249	113,615	2,100	104,192	1,462	74,902
Total	4,520	325,486	7,102	356,887	8,373	408,297
Japan:						
Hawaii			25	1,543	11	675
Los Angeles	410	22,313	135	7,259		
New York	7	36	(1)	18		
San Francisco	591	26,396	20	982	3	231
Washington			50	2,830		
Total	1,008	48,745	230	12,632	14	906
Netherlands: Chicago	1	331				
United Kingdom: Los Angeles			6	466	9	597
Grand total	5,529	374,562	7,338	369,985	8,396	409,800

[1] Less than 1 ton.

Source: Bureau of the Census.

TECHNOLOGY

A new briquetting process that could have a profound effect upon the declining fuel-briquet industry in the United States was announced recently by the Husky Oil Company of Cody, Wyo. Developed at the Husky Briquetting plant in Dickinson, N. Dak., this process manufactures smokeless briquets, suitable for use in outdoor cooking grills, from mineral fuel. Details have not been disclosed, but a newspaper release[4] stated that the briquets, made from lignite, are cleaner, burn hotter, and last longer than those made from hardwood charcoal. A similar process also has been announced by Dominion Briquets and Chemicals, Ltd., Saskatchewan, Canada.[5]

It is difficult to assess the potential of such a development, but a new market, which consumed an estimated one-quarter million tons of wood-charcoal briquets in 1961, has obviously been opened to producers of mineral-fuel briquets. With the continuing trend to outdoor living and the extension of the living room and kitchen to the patio, it is reasonable to assume that there will be an increased demand for barbecue briquets and that present markets will expand.

---

[4] Minneapolis Sunday Tribune, May 7, 1961.
[5] Coal Age, V. 7, No. 1, January 1962, p. 126.

Another method for producing smokeless briquets, from dried, oil-treated coal, mixed with a sulfite lye binder, has been developed in Germany.[6] Other details of the process were not disclosed, but it was stated that such briquets can be burned in a household stove, central-heating boiler, or fireplace without producing smoke or soot.

Laboratory and pilot-plant studies have introduced several new briquetting processes for transforming noncoking coals into metallurgical fuels suitable for blast-furnace use.

Bench-scale experiments by the Bureau of Mines[7] determined that briquets prepared at pressures of 3,000 psi from a mixture of 82 percent anthracite, 10 percent bituminous coal, and 8 percent coal-tar pitch and calcined at 1,750° F, were superior in impact resistance and abrasion to premium furnace and foundry cokes. Good-quality briquets were obtained also when petroleum pitch was substituted for coal-tar pitch under the same conditions. However, petroleum binders were inferior to coal tar, unless they were used in conjunction with bituminous coal. Sulfite liquor was found to be unsatisfactory as a metallurgical-briquet binder in these tests. The effect of coal particle size on briquet strength was also studied, and it was found that the best briquets were made by using 40- by 80-mesh anthracite and minus 20-mesh bituminous coal.

A process for making formed coke that does not fracture or crumble when used in metallurgical furnaces at temperatures as high as 1,300° C has been perfected by the Institute for the Chemical Processing of Coals at Zabzhe, Poland.[8] This process uses a friable char that is ground to minus 3-mm, mixed with a binder, and briquetted. The char is produced by carbonizing coal at 850° C, and the binder is obtained from the distillation of tar that results from the carbonization process. After briquetting, the coke is hardened by heating in air at 250° to 300° C.

A similar process developed in Perth, Australia, produces metallurgical-grade fuel from noncoking, subbituminous coal.[9] The process consists of carbonizing coal at 800° C, grinding the resulting char, briquetting the char with tar binder obtained from the carbonization process, and hardening the briquets, first by heating in flue gas at 200° C and finally by carbonizing at 500° to 600° C. The resulting product is a strong, low-ash fuel, suitable for use in iron-foundry cupolas.

PACKAGED FUEL

CAPACITY

Productive capacity of the packaged-fuel industry decreased slightly because two small plants, active in 1961, discontinued operations. However, one small plant that had no output in 1961 produced a small quantity of packaged fuel in 1962. As with the briquet industry, packaged-fuel operations have declined steadily in the past decade; the industry, currently, is about one-third as large as it was in 1952, the year previous to the start of the decline. During the period 1952–62, capacity decreased by 246,000 tons, and operating plants decreased from 43 to 15. Although this industry has more plants than the briquet industry, it is less than one-twentieth the size, having an annual productive capacity in 1962 of only 113,000 tons. Most plants are small; 11 had capacities of less than 5,000 tons and only one was capable of producing more than 25,000 tons.

---

[6] Coal Age, V. 66 No. 12, December 1961, p. 33.

[7] Sanner, W. S., R. E. McKeever, and J. W. Eckerd. Bench-Scale Experiments in Developing Anthracite Metallurgical Briquettes. Proc. Blast Furnace, Coke Oven, and Raw Materials Con., AIME, Philadelphia, Pa., V. 20, 1961, pp. 55–86.

[8] Coke and Chemistry, U.S.S.R. No. 8, 1961, pp. 51–52.

[9] Fuel Abstracts and Current Titles. V. 3, No. 12, December 1962, abs. 8072.

TABLE 13.—Annual capacity and production of packaged-fuel plants in the United States

	Active plants	Annual capacity (short tons)	Production	
			Short tons	Percent of capacity
1958	23	141,800	35,769	25.2
1959	21	138,100	33,715	24.4
1960	19	123,000	24,706	20.1
1961	16	114,800	19,180	16.8
1962:				
Plants with capacity of—				
Less than 5,000 tons	11	23,100	2,454	10.6
5,000 to less than 10,000 tons	1	[1] 89,800	[1] 14,985	16.7
10,000 to less than 15,000 tons	1			
15,000 to less than 25,000 tons	1			
25,000 or more tons	1			
Total	15	112,900	17,439	15.4
Plants with production of—				
Less than 1,000 tons	12	30,900	2,910	9.4
1,000 to less than 3,000 tons	1	[1] 82,000	[1] 14,529	17.7
3,000 to less than 5,000 tons	1			
5,000 to less than 10,000 tons	1			
Total	15	112,900	17,439	15.4

[1] Combined to avoid disclosing individual company figures.

PRODUCTION

Production of packaged fuel decreased 9 percent in 1962, chiefly because nine plants reported smaller outputs than in 1961. The loss from these plants was partially offset by the production of four other plants that reported increased outputs. Total output was 55 percent less than in the base years 1957–59.

Production rates continued to decline; the average rate of operation for the industry based upon capacity was 15.4 percent, 1.4 points lower than in 1961.

Fifteen producers in six States reported production. Michigan, with 51 percent of the total, had the largest output. Indiana, Ohio, and Wisconsin produced most of the remainder. Michigan and Ohio, with five plants each, had the largest number of operations. Plants in Ohio are small, however, and total output of the State was only 1,274 tons.

Production was seasonal, ranging from 3,322 tons in January to 411 tons in July. Virtually all packaged fuel produced in 1962 was sold; about three-fourths of the total production was sold in the local area.

Production was slightly less than the combined total of fuels and binders because of breakage and other minor losses.

TABLE 14.—Production and shipments of packaged fuel in the United States, by States

State	Active plants	Production (short tons)	Shipments		
			Short tons	Value	
				Total	Average
1961:					
Indiana	3	3,015	3,015	$69,130	$22.93
Michigan	4	10,077	9,902	240,884	24.33
Ohio	5	1,491	1,491	32,771	21.98
Other States	[1] 4	4,597	4,597	98,712	21.47
Total	16	19,180	19,005	441,497	23.23
1962:					
Indiana	(2)	(2)	(2)	(2)	(2)
Michigan	5	8,874	8,694	$210,669	$24.23
Ohio	5	1,274	1,274	27,215	21.36
Other States	[3] 5	7,291	7,291	156,181	21.42
Total	15	17,439	17,259	394,065	22.83

[1] Comprises 1 plant each in Illinois, Minnesota, Virginia, and Wisconsin.
[2] Included with "Other States" to avoid disclosing individual company figures.
[3] Comprises 1 plant each in Illinois, Virginia, and Wisconsin and 2 plants in Indiana.

TABLE 15.—Production of packaged fuel in the United States in 1962, by months

Month	Short tons	Month	Short tons	Month	Short tons
January	3,322	May	523	September	690
February	2,587	June	496	October	1,558
March	2,297	July	411	November	1,750
April	1,461	August	431	December	1,913

RAW MATERIALS

Raw Fuels.—Packaged fuel was manufactured principally from low-volatile bituminous coal. One plant, however, used a small amount of petroleum coke and high-volatile bituminous coal. A small percentage of the raw fuels was yard screenings that had accumulated in coal yards; the remainder was purchased from other sources, chiefly from docks and other points where coal was unloaded. Eight plants used yard screenings exclusively; three used fuel purchased from other sources; and four used both types. Most of the small plants confined their output to yard screenings, whereas the larger plants obtained most of their raw fuel from other sources.

The average value per ton of raw fuels consumed was $9.44, 92 percent of the cost per ton of total raw materials.

Binders.—Starch was used exclusively as a binder by 13 of the 15 active plants. One plant used petroleum asphalt, and another used a mixture of starch and asphalt. Starch was preferred because only small quantities were required, and binder cost per ton of production was relatively low. Exact data on starch and asphalt binders could not be shown, but the plants that used starch exclusively consumed approximately 15 pounds of starch, worth about $0.75, in producing each ton of packaged fuel.

The average value per ton of all binders consumed was $33.88. Binders in Illinois and Indiana averaged $92.33 per ton, and those of Ohio, $112 per ton. Plants in these States used starch only. Binders used by plants in Michigan had a lower unit value because one plant used asphalt, which has approximately one-fourth the value of starch. The low value of the binder shown for plants in other States was influenced by one large plant that used asphalt exclusively.

TABLE 16.—Quantity and value of raw materials used in making packaged fuel in the United States in 1962, by States

State	Short tons	Value	
		Total	Average
	Fuels		
Michigan	8,869	$77,455	$8.73
Ohio	1,272	14,216	11.18
Other States [1]	7,133	71,431	10.01
Total	17,274	163,102	9.44
	Binders		
Michigan	254	$8,721	$34.33
Ohio	11	1,228	111.64
Other States [1]	344	10,683	31.06
Total	609	20,632	33.88
	Total		
Michigan	9,123	$86,176	$9.45
Ohio	1,283	15,444	12.04
Other States [1]	7,477	82,114	10.98
Total	17,883	183,734	10.27

[1] Comprises 1 plant each in Illinois, Virginia, and Wisconsin and 2 plants in Indiana.

SHIPMENTS

All packaged fuel was sold locally except the output of one plant. Of the quantity sold in the local area, about one-third was purchased by consumers at the plant where it was manufactured. The remainder was delivered by the producer. Demand kept pace with production in 1962, and virtually the entire output of the industry was sold. Shipments out of the local area were made chiefly by truck, but a small quantity was shipped by rail.

VALUE AND PRICE

The total value of packaged-fuel shipments, based upon an average f.o.b. plant price of $22.83 per ton, was $394,065. Compared with 1961, the average price per ton, f.o.b. plant, decreased 2 percent.

The unit value of packaged fuel was about one-third greater than the value of fuel briquets, but the values are not comparable because the products and marketing methods are different. Because most briquets were sold in bulk for residential heating, their prices were roughly competitive with those of other bulk solid fuels. Also, most were sold through wholesale and retail channels, and the actual price to the consumer was substantially greater than the f.o.b. plant value. In contrast, packaged fuel is a specialty item, sold chiefly in small quantities directly to consumers. The f.o.b. plant value was, therefore, approximately equal to the retail price.

WORLD REVIEW

Production of fuel briquets and other processed solid fuels of mineral origin throughout the world in 1962 was estimated at 127.8 million short tons. This was a 4-percent increase over 1961 production and is attributed chiefly to larger outputs of lignite briquets in East Germany and coal briquets in France and West Germany.

Ninety-two percent of the total briquets was produced in Europe. East Germany, the largest producer, manufactured about one-half of the world total, all from lignite. West Germany ranked second with 19 percent of the world total. West German briquets were also made principally from lignite, but about one-fourth was manufactured from anthracite and bituminous coal. Briquets in both countries were used extensively to supplement supplies of other fuels, particularly for residential heating.

Production in the Soviet Union was estimated at 9.4 million tons, 7 percent of the world total. Data were not available on the quantity of different fuels briquetted in the U.S.S.R., but it was estimated that about one-third of the output was manufactured from peat, and the remainder, from anthracite, subbituminous, and bituminous coals. As in other European countries, briquets in the Soviet Union are used principally for domestic heating and fuel for light industries.

Production of briquets in France in 1962 rose to the highest level since 1958, amounting to 6 percent of the world total. Briquets were produced in 17 other European countries, and their combined output was 8 percent of the world total. Production in individual countries was relatively small, however, and only five produced more than 1 million tons.

Six percent of all briquets was produced in Asia, chiefly in Korea and Japan. Both countries use large quantities of briquets for domestic heating and cooking. In Japan, about 2.5 million tons of briquets, consumed chiefly for household fuel, was made from anthracite, or a mixture of anthracite and coke or coke breeze. An additional 2 million tons of pitch briquets, made from bituminous coal, was used by the Japanese Railway Corp. for fuel. Five other Asiatic countries also produced minor quantities of briquets.

Australia had 2 percent of the total production, and the remainder (less than 1 percent) was produced in Algeria, Morocco, New Zealand, Canada, and the United States. The United States had 0.5 percent of the total output and ranked 15th in world production.

TABLE 17.—World production of fuel briquets and packaged fuel, by countries [1]

(Thousand short tons)

Country	1958	1959	1960	1961	1962
North America:					
Canada	204	153	81	67	[2] 65
United States:					
Briquets	1,035	866	744	572	570
Packaged fuel	36	34	25	19	17
Total	1,275	1,053	850	658	652
South America: Peru	9	4	[2] 6	--	--
Europe:					
Austria	2	--	--	--	--
Belgium	1,143	1,105	1,189	1,240	[2] 1,650
Bulgaria [2]	275	275	275	275	275
Czechoslovakia:					
Bituminous	433	417	360	[2] 370	[2] 375
Lignite	365	362	481	[2] 490	[2] 500
Denmark	83	49	53	50	[2] 55
Finland	11	10	9	12	[2] 11
France	7,833	7,234	6,695	6,704	7,647
Germany:					
East: Lignite	59,534	59,578	61,787	63,930	65,834
West:					
Anthracite and bituminous	6,209	5,192	5,753	5,367	6,242
Lignite	18,119	16,761	16,805	17,102	17,416
Hungary	1,049	1,193	1,171	1,253	[2] 1,300
Ireland	36	49	109	214	[2] 210
Italy: Anthracite	12	26	30	[2] 30	[2] 35
Netherlands:					
Anthracite and bituminous	1,197	1,168	1,302	1,310	[2] 1,320
Lignite	83	71	69	82	[2] 80
Poland:					
Bituminous	707	753	791	744	[2] 770
Lignite	303	353	345	373	[2] 375
Portugal	83	66	60	62	[2] 40
Rumania [2]	300	305	330	330	330
Spain	1,580	1,408	1,260	1,232	[2] 1,320
Sweden	69	[2] 65	[2] 65	[2] 65	[2] 65
Switzerland [2]	110	110	110	110	110
U.S.S.R. [2]	9,400	9,400	9,400	9,400	9,400
United Kingdom	2,463	1,926	1,627	1,702	[2] 1,760
Yugoslavia	19	18	10	[2] 20	[2] 20
Total	111,400	107,900	110,100	112,500	117,100
Asia:					
Afghanistan	[2] 24	[2] 24	[2] 22	21	[2] 20
Indonesia	32	11	[2] 11	[2] 11	[2] 11
Japan [2]	2,540	2,480	2,980	3,250	3,300
Korea, Republic of	1,203	2,454	3,206	[2] 4,400	[2] 4,400
Pakistan [2]	13	17	17	22	22
Turkey	128	139	154	74	[2] 75
Vietnam, South [2]	55	60	60	60	60
Total	4,000	5,200	6,450	7,800	7,900
Africa:					
Algeria	56	54	50	44	[2] 30
Morocco	20	22	25	26	25
Tunisia	2	[2] 6	[2] 6	--	--
Total	78	82	81	70	55
Oceania:					
Australia	723	753	1,694	2,062	[2] 2,090
New Zealand	19	18	17	17	[2] 15
Total	742	771	1,711	2,079	2,105
World total	117,500	115,000	119,200	123,100	127,800

---

[1] Includes briquets made from coal, lignite, and peat and revisions of data published previously. Data do not add to totals shown owing to rounding.

[2] Estimated.

Compiled by Pearl J. Thompson, Division of Foreign Activities.

Peat

By Eugene T. Sheridan[1] and Maxine M. Otero[2]

◆

Contents

	Page		Page
General summary	291	Consumption and uses	299
Government regulations	294	Value and price	301
Scope of report	294	Foreign trade	302
Reserves	296	Technology	305
Production	298	World review	306

GENERAL SUMMARY

Peat production in the United States continued to increase in 1962 and total output for the year was 571,873 short tons. This was an 8-percent increase over the 531,067 tons produced in 1961, 61 percent more than average annual production in 1957–59, and the largest output reported to date.

One hundred and sixteen producers in 23 States reported production or commercial sales of peat at 117 operations for 1962. Michigan, with nearly one-fourth of the active operations and 45 percent of the total output, remained the largest peat-producing State. Indiana and Washington followed Michigan in production, with 9 percent and 7 percent, respectively, of the total output.

Approximately 19 percent of the production was reported as moss peat; 52 percent, reed-sedge peat; and 29 percent, peat humus. Eleven percent was unprepared; the remainder was processed by shredding and screening, and, in a few instances, artificial drying. Fifty-two percent was reported to have been cultivated before extraction.

Virtually all domestic peat is used for agricultural and horticultural purposes. Of the total peat distributed 94 percent was sold for general soil improvement to contractors for landscaping and building lawns and to nurserymen, gardeners, and homeowners for starting and growing plants, improving lawns and garden soils, and for mulching. A small quantity was sold for specialized uses such as potting soils and seed inoculant, and for use in mushroom beds, mixed fertilizers, and earthworm culture. No peat was reported sold for fuel or energy in the United States.

---

[1] Supervisory mineral specialist, Division of Bituminous Coal.

[2] Supervisory statistical assistant, Division of Bituminous Coal.

Packaged domestic peat was sold in virtually all States; peat sold in bulk was distributed chiefly within the producing area. Forty-seven percent of the total sales was bulk; the remainder was packaged, chiefly in moistureproof bags weighing 25, 50, and 100 pounds. Thirty-nine of the producers sold peat in packages.

The total value of commercial sales was $5.2 million, a 12-percent increase over that of 1961. The average unit value for sales decreased, however, from $9.48 per ton in 1961 to $9.15 per ton in 1962.

Imports increased 6 percent over 1961, chiefly because of increased shipments from Canada. Imports from Europe decreased.

World production of peat was estimated at 169.7 million short tons. This was more than twice the quantity estimated in 1957–59, but the 1962 data include peat used for agriculture in the U.S.S.R. The U.S.S.R. was the leading peat producer, with 95 percent of the estimated world output. The United States ranked fourth in world production.

Salient statistics for the base and current years are shown in table 1. Figure, 1, showing production and import data, indicates the peat available for consumption for 1951–62.

TABLE 1.—Salient peat statistics

	1957 59 (average)	1960	1961 [1]	1962
United States:				
Number of operations	87	115	128	117
Production short tons	354, 497	470, 889	531, 067	571, 873
Commercial sales do	342, 711	430, 664	492, 798	566, 441
Value of sales	$3, 556, 218	$4, 456, 510	$4, 672, 933	$5, 185, 627
Average per ton	$10 38	$10. 35	$9. 48	$9. 15
Imports short tons	267, 525	263, 877	252, 437	267, 678
Available for consumption [2] do	610 236	694, 541	745, 235	834, 119
World production do	[3] 71, 100, 000	168, 500, 000	166, 200, 000	169, 700, 000

[1] Revised figures.

[2] Commercial sales plus imports.

[3] In addition, the U.S.S.R. produced an undetermined quantity of agricultural peat

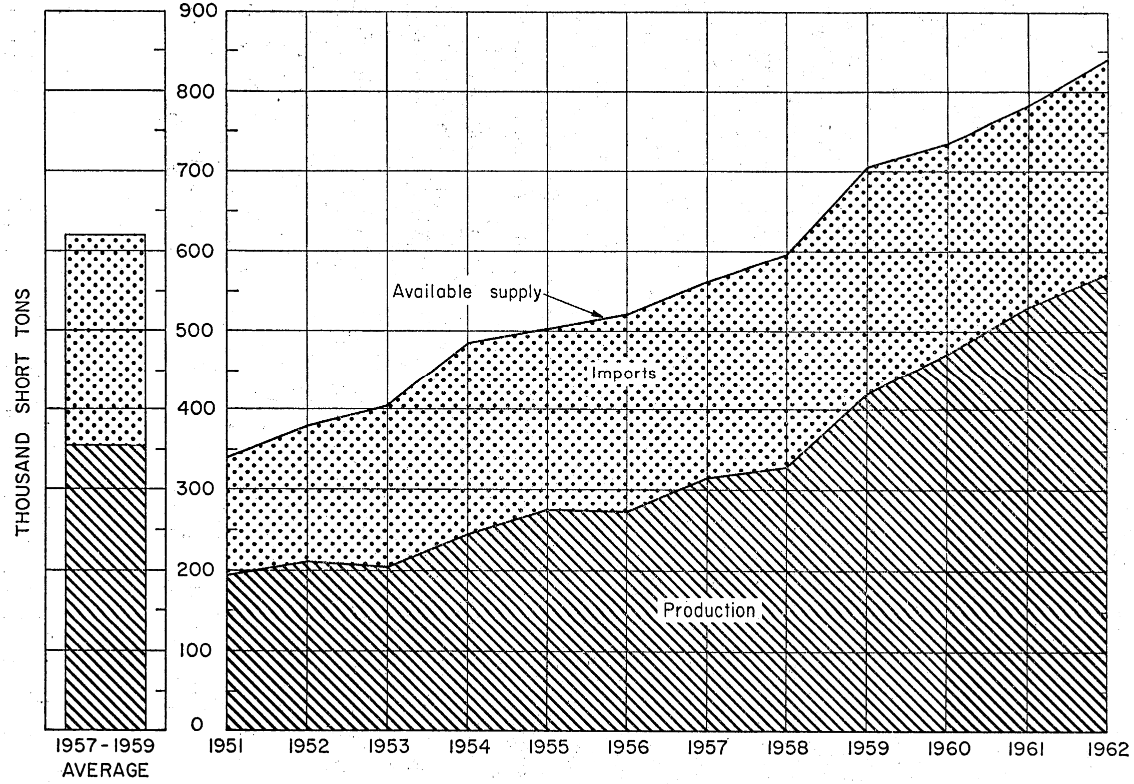


Figure 1.—Production, imports, and available supply of peat in the United States, 1951–62.

GOVERNMENT REGULATIONS

There are no national standards in the United States for differentiating peats according to their various chemical and physical characteristics, and suitability for different uses. The sale of peat, however, is governed by trade regulations, established by the Federal Trade Commission, to promote fair labeling and selling practices within the industry. In general, the regulations forbid unfair or deceptive practices in marketing, misrepresentations, and the use of deceptive trade or corporate names. They also state the requirements for labeling a product "peat" and the manner in which the terms "peat moss" and "moss peat" may be used. According to the regulations, peat is any partially decomposed plant matter that has accumulated under water or in a water-saturated environment. It is unlawful to designate a product "peat" unless 75 percent of the material, on a dry-weight basis, is composed of peat, as defined previously, and the remainder consists of normally associated soil materials. A product labeled "moss peat" must conform to this definition and the peat must have been formed from sphagnum, hypnum, or other mosses. The use of the term "peat moss," a misnomer generally applied to all types of peat, also is subject to the requirements for "moss peat" except when the kind or kinds of peat of which the product is composed are conspicuously stated in immediate conjuction with the term "peat moss."

The trade practice rules also prohibit discriminatory practices in pricing, grants for services or facilities, and advertising or promotional allowances. To further protect the public and assist consumers in using the various kinds of peat, the rules recommend that producers voluntarily furnish such information as degree of acidity, ash content, moisture-holding capacity, and degree of decomposition of the peat. They also recommend that peat be sold on a dry-measure basis, and that information be furnished on the principal uses for which the product is suitable.

Government purchases of peat are subject to Federal specifications, developed by the Federal Supply Service, General Services Administration. The current specification, Q-P-00166d(AGR-ARS), June 20, 1960, classifies and lists the requirements for four types of peat: (1) sphagnum-moss peat, (2) other moss peats, (3) humus peat, and (4) reed-sedge peat. The Federal Supply Service also supplies information on sampling, inspection, and testing procedures, and outlines the requirements for packaging and marking containers.

SCOPE OF REPORT

The Bureau of Mines annually canvasses all known peat operations in the United States and publishes an economic report on the peat industry, based upon reports submitted voluntarily by individual producers. This survey has been continuous since 1934 when the Bureau resumed the canvass conducted from 1908 to 1926 by the Federal Geological Survey. No data were collected or published by either agency between 1926 and 1934.

Complete coverage of the industry was attempted, and all reported production is included in this report. No estimates were made for nonreporting companies, and a company was assumed to have been idle or not a producer if there was no response. Questionnaires were mailed to all companies that reported commercial production within the past 3 years; also to companies who were reported as possible peat producers. Mailing lists are kept current by requesting producers to furnish the names and addresses of new operations in their areas; by checking individual State mineral and commodity reports; and from information furnished by Bureau of Mines field personnel in various areas of the United States.

The survey revealed that there were 117 active and 15 idle peat operations in 1962. Nine companies reported that they had abandoned their operations and 33 companies did not respond to the survey, or did not produce peat. Two of the active plants did not produce peat but sold peat from stocks. Because of the nature of the peat industry in the United States, this survey may have failed to reach all producers. However, all major and most of the smaller producers were canvassed, and the data on production include virtually all peat that was produced in the United States for commercial sale.

Peat is classified in this report as three general types—moss peat, reed-sedge peat, and humus. The first two differentiate peat according to botanical origin. The moss type is that formed chiefly from sphagnum, hypnum, or other mosses, while reed-sedge peat originates from reeds, sedges, and other associated swamp plants. In both types the plant remains are identifiable, but the latter usually are more decomposed than those formed from mosses. Humus includes all peat so decomposed that its biological identity cannot be determined. Humus is sometimes called peat muck.

These classifications are less restrictive than those of the Federal specifications, but the nature of the industry makes it impractical to make them more limiting, particularly for reporting purposes. A few producers reported production of more than one type of peat, because in some instances deposits contained layers of different types that were removed separately.

Unprepared peat had no processing after excavation other than air drying. Processed peat was shredded and screened, and a few operations also artificially dried peat. Cultivating refers to a process for aerating peat prior to excavation by turning over the surface layer of the deposit with a disk or spring-toothed harrow.

Data were requested on production, sales, values, uses, location and size of deposits, and types of equipment used. Data on uses include peat produced in the United States only, as no information was available on imported peat other than that it was imported for use in soil improvement or for poultry and stable litter. In a few instances where the use for which peat was sold was not reported, the production was assumed to have been sold for general soil improvement.

All values for domestic peat were based upon producers' selling prices at the plant. These values do not include the cost of containers for peat sold in packages, although the cost of containers may have been included by some producers. In a few instances, values were estimated when a producer failed to state the value of his sales.

All quantities are shown in short tons of 2,000 pounds.

RESERVES

The peat resources of the United States have been extensively surveyed, and known reserves are estimated at approximately 14 billion short tons of air-dried peat. These resources are widely distributed and deposits occur in 34 States. Approximately nine-tenths of the total, however, are in four States—Florida, Michigan, Minnesota, and Wisconsin.

Major peat deposits occur in two general geographic areas. The northern region (with about 80 percent of the total reserves) covers, roughly, the area north and each of the 41st parallel and 97th meridian. It includes all of the New England States, Illinois, Indiana, Iowa, Michigan, Minnesota, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin. The Atlantic coast region, with most of the remaining reserves, includes all of Florida and the coastal areas of all States south of New Jersey that border the Atlantic Ocean.

In the northern region, peat has accumulated chiefly in former lakes, marshes, and ponds, and the deposits are classified according to topography as the filled-basin type. They consist of partially decomposed peat, formed principally from reeds, sedges, grasses, or other swamp plants, underlain by a layer of well-decomposed peat that formed from algae and other simple plants when the basin was first established. In many areas these deposits are covered with a layer of "built-up" peat, formed principally from mosses and shrubs that grew on the surface of the deposit after the basin was filled to the level of the surrounding countryside. In most areas this stratum of moss peat is quite thin. In others, however, where drainage was poor, moss peat has accumulated to a thickness of many feet. In a few of the northern areas, particularly Maine, there are large deposits of built-up peat, formed from the accumulation of mosses and shrubs on flat or gently sloping surfaces.

The Atlantic coast region is characterized by many salt- and fresh-water marshes and swamps, and peat deposits occur principally in valleys and lagoons that were formed by the gradual subsidence of the coastal plain. This peat has formed principally from salt-marsh grasses and other salt-water plants; however, many deposits also have an underlayer of peat formed from fresh-water plants that were deposited before the time of the coastal subsidence. Deciduous and coniferous trees also have contributed to peat formation in many areas in this region.

Approximately 75 percent of the total U.S. reserves are in three northern States—Minnesota, Wisconsin, and Michigan. Deposits occur in most areas of all three States; the bulk of the peat, however, is found north of the 45th parallel. This region is characterized by relatively low temperatures and high humidity which are conducive to peat formation.

Minnesota's reserves, estimated at 6.8 billion tons, are the largest in the United States. Peat deposits are virtually in all areas of Minnesota, but more than three-fourths of the total reserves are in four northern counties.

Wisconsin has about 1 million acres of peat lands and reserves are estimated at 2.5 billion tons. As in Minnesota, these are widely scattered, but the most extensive deposits are in the northern part of the State.

Michigan's reserves are estimated at 1 billion tons. Deposits are well distributed throughout the State, but the largest and most extensive are in the north where some bogs exceed 25 square miles, and are from 2 to 20 feet deep. Many smaller deposits are also in central and southern Michigan.

Peat occurs in all New England States, but four-fifths of the New England reserves are in Maine. Maine's reserves are estimated at 100 million tons, of which about one-half occurs in the coastal areas and near the lower courses of major streams. The remainder is in heavily forested areas in the northern and western parts of the State, and is relatively inaccessible.

All States along the Atlantic coast have peat deposits, but about 75 percent of the estimated 2.7 billion tons of the Atlantic coastal region is in Florida. Peat occurs in virtually all parts of Florida, which ranks third in total U.S. reserves. The Dismal Swamp in Virginia and North Carolina is the second largest peat area of the Atlantic coast region.

There are small deposits of peat also in the coastal areas of Alabama, Louisiana, Mississippi, and Texas; in California, Oregon, and Washington on the west coast; and in Colorado, Idaho, and Montana. Less than 1 percent of the total U.S. reserves are in these States.

Known original reserves of peat in the United States, as reported by the Federal Geological Survey in 1922, are shown in table 2.

TABLE 2.—Known original reserves of peat in the United States, estimated on an air-dried basis, by regions and States[1]

(Thousand short tons)

Region and State	Reserves
Northern region:	
Minnesota	6,835,000
Wisconsin	2,500,000
Michigan	1,000.000
Iowa	22,000
Illinois	10.000
Indiana	13,000
Ohio	50.000
Pennsylvania	1,000
New York	480,000
New Jersey	15,000
Maine	100,000
New Hampshire	1,000
Vermont	8.000
Massachusetts	12.000
Connecticut	2,000
Rhode Island	1,000
Total	11,050,000
Atlantic coast region:	
Virginia and North Carolina	700,000
Florida	2,000,000
Other States[2]	2,000
Total	2,702,000
Other regions:	
Gulf coast[3]	2,000
California	72,000
Oregon and Washington	1,000
Total	75,000
Total all regions	13,827,000

[1] Geological Survey, Coal Resources of the United States (Progress Report): Circ. 293, Oct. 1, 1953, p. 38.
[2] Includes Delaware, Maryland, South Carolina, and Georgia.
[3] Excludes Florida.

PRODUCTION

Despite a decrease in operating plants, peat production continued upward, and output for the year reached 571,873 short tons. This was an 8-percent increase over that of 1961, and 61 percent more than was produced in 1957–59.

Peat was produced at 117 operations, 11 less than the number active in 1961. Michigan, with 28, had the largest number of active plants, nearly one-fourth of the total. One additional producer in Michigan is not included in this report because the survey was closed when the producer responded. Washington and Ohio followed Michigan, with 16 and 12 operations, respectively.

Michigan was the largest producer with 45 percent of the output. Following were Indiana with 9 percent, Washington with 7 percent, and California and Pennsylvania with 6 percent each.

Approximately 19 percent of the production was moss peat; 52 percent, reed-sedge peat; and 29 percent, humus. Eleven percent was sold as excavated, after it was air-dried; the remainder was processed by shredding and screening, and, in a few instances, artificial drying. Approximately one-half of the total peat was cultivated before it was extracted. This method of preparation is described previously under "Scope of Report."

Production methods varied greatly, but virtually all peat was excavated with some type of machinery. Most of the equipment consisted of conventional types of excavating and earthmoving machines, including power shovels, earth movers, draglines, bulldozers, clamshells, dredges, front-end loaders, and belt and bucket loaders. A few operations employed specially designed excavating and conveying equipment. Processing machinery included a variety of shredders, grinders, hammermills, screens, and rotary dryers.

Table 4 shows production, commercial sales, and the number of active plants in each State.

TABLE 3.—Peat produced in the United States in 1962, by kinds

(Short tons)

Kind	Total	Unprepared	Processed	
			Shredded	Shredded and kiln-dried
Moss	106,288	4,895	94,643	6,750
Reed-sedge	297,508	19,415	277,589	504
Humus	168,077	38,795	126,813	2,469
Total	[1] 571,873	63,105	499,045	9,723

[1] Includes 295,107 tons of cultivated peat.

TABLE 4.—Production and commercial sales of peat in the United States, by States

State	1961				
	Active plants	Production (Short tons)	Commercial sales		
			Short tons	Value	
				Total	Average
Alaska	[1] 1	[1] 430	[1] 430	(2)	(2)
California	5	46,348	43,348	$486,582	$11.23
Colorado	4	9,894	9,894	43,870	4.43
Connecticut, Massachusetts, and New Hampshire	4	5,002	5,002	51,770	10.35
Florida	[1] 6	[1] 26,673	[1] 25,823	[1] 143,549	[1] 5.56
Georgia and South Carolina	3	(2)	(2)	(2)	(2)
Idaho and Montana	5	8,885	2,015	38,054	18.89
Illinois, Iowa, and Wisconsin	7	20,585	20,585	232,574	11.30
Indiana	7	57,146	49,452	456,782	9.24
Maine	----------	----------	----------	----------	----------
Maryland	1	(2)	(2)	(2)	(2)
Michigan	[1] 30	[1] 210,376	[1] 206,741	[1] 1,990,881	[1] 9.63
Minnesota	7	11,091	5,931	124,853	21.05
New Jersey	4	21,257	17,277	167,012	9.67
New York	3	11,209	8,329	91,800	11.02
Ohio	15	9,113	9,113	122,881	13.48
Pennsylvania	6	27,993	24,993	251,154	10.05
Washington	[1] 20	[1] 57,393	[1] 56,193	[1] 356,355	[1] 6.34
Undistributed	----------	7,672	7,672	114,816	----------
Total	[1] 128	[1] 531,067	[1] 492,798	[1] 4,672,933	[1] 9.48
	1962				
Alaska	1	64	64	(2)	(2)
California	5	33,901	33,901	$330,916	$9.76
Colorado	4	12,351	12,351	68,175	5.52
Connecticut, Massachusetts, and New Hampshire	[3] 3	4,515	4,515	46,734	10.35
Florida	6	21,592	20,595	138,678	6.73
Georgia and South Carolina	3	(2)	(2)	(2)	(2)
Idaho and Montana	3	18,585	18,585	192,652	10.37
Illinois, Iowa, and Wisconsin	6	21,591	21,591	289,798	13.42
Indiana	5	51,710	47,430	272,238	5.74
Maine	3	3,050	1,250	47,277	37.82
Maryland	1	(2)	(2)	(2)	(2)
Michigan	28	257,533	257,693	2,276,702	8.83
Minnesota	7	12,934	14,386	307,323	21.36
New Jersey	4	26,066	29,099	246,852	8.48
New York	3	16,200	14,400	113,000	7.85
Ohio	12	7,783	7,383	105,708	14.32
Pennsylvania	7	32,936	32,936	368,717	11.19
Washington	16	42,762	41,962	288,215	6.87
Undistributed	----------	8,300	8,300	92,642	----------
Total	117	571,873	566,441	5,185,627	9.15

[1] Revised figure.
[2] Included with "Undistributed" to avoid disclosing individual company figures.
[3] Excludes New Hampshire.

CONSUMPTION AND USES

Both imports and sales of domestic peat increased, and more peat was consumed than in any previous year.

Peat was sold for a variety of agricultural and horticultural uses, but 94 percent of the total was reported by producers as sold for general soil improvement. This peat was used chiefly by homeowners for mulching and improving lawns and garden soils; by landscape contractors and gardeners for building lawns and transplanting trees and shrubs; and by nurseries and greenhouses. Five percent was sold for use in potting soils, seed inoculant, mushroom beds, mixed fertilizers, and packing flowers and shrubs. The remaining 1 percent was used for seed beds and earthworm culture. No peat was sold for fuel or energy.

Fifty-three percent of all peat sold was packaged. This was 45 percent more than the quantity sold packaged in 1961, and nearly 3 times the amount sold packaged in 1957–59. The sharp increase in packaged sales in recent years has resulted from the introduction of synthetic films from which inexpensive, moistureproof bags can be manufactured. These containers have enabled producers to distribute peat nationally, although only a few years ago it was uneconomical to ship peat out of the producing area.

Most of the packaged domestic peat is sold on a weight basis in containers of 25, 50, and 100 pounds. It is distributed chiefly through retail outlets such as garden centers, hardware, drug, and variety stores, and food supermarkets.

Commercial sales by States, kinds, and uses are shown in tables 5, 6, and 7.

TABLE 5.—Commercial sales of peat in the United States, by States

State	In bulk		In packages		Total	
	Short tons	Value	Short tons	Value	Short tons	Value
	1961					
Alaska	[1] 430	(2)	---------	---------	[1] 430	(2)
California	17,498	$216,032	25,850	$270,550	43,348	$486.582
Colorado	9,894	43,870	---------	---------	9,894	43,870
Connecticut, Massachusetts, and New Hampshire	4,702	42,170	300	9,600	5,002	51,770
Florida	[1] 25,823	[1] 143,549	---------	---------	[1] 25,823	[1] 143,549
Georgia and South Carolina	(2)	(2)	(2)	(2)	(2)	(2)
Idaho and Montana	1,500	18,000	515	20,054	2.015	38,054
Illinois, Iowa, and Wisconsin	19,158	117,309	1,427	115,265	20,585	232,574
Indiana	39,205	322,948	10,247	133,834	49.452	456,782
Maine	---------	---------	---------	---------	---------	---------
Maryland	(2)	(2)	(2)	(2)	(2)	(2)
Michigan	[1] 68,779	[1] 353,027	137,962	1,637,854	[1] 206,741	[1] 1,990,881
Minnesota	1,609	16,593	4,322	108,260	5,931	124,853
New Jersey	13,913	122,012	3,364	45,000	17,277	167,012
New York	4,779	49,100	3,550	42.700	8,329	91,800
Ohio	7,831	67,215	1,282	55,666	9,113	122.881
Pennsylvania	22.242	182.261	2.751	68.893	24,993	251,154
Washington	[1] 43,840	[1] 151,327	12,353	205,028	[1] 56,193	[1] 356.355
Undistributed	5,481	77,772	2.191	37.044	7.672	114.816
Total	[1] 286,684	[1] 1,923,185	206,114	2,749.748	[1] 492,798	[1] 4,672.933
	1962					
Alaska	64	(2)	---------	---------	64	(2)
California	15.761	$160.696	18,140	$170,220	33,901	$330,916
Colorado	12,246	67,275	105	900	12,351	68,175
Connecticut, Massachusetts, and New Hampshire	2,415	22,334	2,100	24,400	4,515	46,734
Florida	20,595	138,678	---------	---------	20,595	138,678
Georgia and South Carolina	(2)	(2)	(2)	(2)	(2)	(2)
Idaho and Montana	1,000	12,000	17,585	180.652	18,585	192,652
Illinois, Iowa, and Wisconsin	19,725	136,188	1,866	153,610	21,591	289,798
Indiana	15,611	105,006	31,819	167,232	47,430	272,238
Maine	---------	---------	1,250	47,277	1,250	47,277
Maryland	(2)	(2)	(2)	(2)	(2)	(2)
Michigan	62,421	357,964	195,272	1,918,738	257,693	2,276,702
Minnesota	7,550	75,657	6,836	231,666	14,386	307,323
New Jersey	27,289	222,017	1,810	24,835	29,099	246,852
New York	9,400	63,000	5,000	50,000	14,400	113,000
Ohio	6,243	56,187	1,140	49,521	7,383	105,708
Pennsylvania	27,205	228,784	5,731	139,933	32,936	368.717
Washington	34,462	138,215	7,500	150,000	41,962	288,215
Undistributed	6,375	62,873	1,925	29,769	8,300	92,642
Total	268,362	1,846,874	298,079	3,338.753	566,441	5,185,627

[1] Revised figure.
[2] Included with "Undistributed" to avoid disclosing individual company figures.

TABLE 6.—Commercial sales of peat in the United States in 1962, by kinds and uses

Use	Moss			Reed-sedge			Humus		
	Short tons	Value		Short tons	Value		Short tons	Value	
		Total	Average		Total	Average		Total	Average
Bulk:									
Soil improvement	42, 928	$315, 742	$7. 36	73, 947	$596, 970	$8. 07	129, 392	$736, 814	$5. 69
Other uses	1, 405	10, 524	7. 49	14, 991	167, 241	11. 16	5, 699	19, 583	3. 44
Total	44, 333	326, 266	7. 36	88, 938	764, 211	8. 59	135, 091	756, 397	5. 60
Packaged:									
Soil improvement	59, 709	728, 942	12. 21	204, 977	2, 029, 759	9. 90	24, 177	293, 303	12. 13
Other uses	186	4, 720	25. 38	6, 326	74, 953	11. 85	2, 704	207, 076	76. 58
Total	59. 895	733, 662	12. 25	211, 033	2, 104, 712	9. 96	26, 881	500, 379	18. 61
Total:									
Soil improvement	102, 637	1, 044, 684	10. 18	278, 924	2, 626, 729	9. 42	153, 569	1, 030, 117	6. 71
Other uses	1, 591	15, 244	9. 58	21, 317	242, 194	11. 36	8, 403	226, 659	26. 97
Grand total	104, 228	1, 059, 928	10. 17	300, 241	2, 868, 923	9. 56	161, 972	1, 256, 776	7. 76

TABLE 7.—Commercial sales of peat in the United States in 1962, by uses

Use	In bulk			In packages			Total		
	Short tons	Value		Short tons	Value		Short tons	Value	
		Total	Average		Total	Average		Total	Average
Soil improvement	246, 267	$1, 649, 526	$6. 70	288, 863	$3, 052, 004	$10. 57	535, 130	4, 701, 530	$8. 79
Potting soils	9, 113	40, 469	4. 44	4, 538	46, 465	10. 24	13, 651	86, 934	6. 37
Packing flowers, shrubs, etc	4, 987	33, 649	6. 75	2, 176	41, 185	18. 93	7, 163	74, 834	10. 45
Seed inoculant	-------	-------	-------	2, 469	198, 835	80. 53	2, 469	198, 835	80. 53
Mushroom beds	1, 681	17, 835	10. 61	-------	-------	-------	1, 681	17, 835	10. 61
In mixed fertilizers	939	11, 090	11. 81	-------	-------	-------	939	11, 090	11. 81
Other[1]	5, 375	94, 305	17. 55	33	264	8. 00	5, 408	94, 569	17. 49
Total	268, 362	1, 846, 874	6. 88	298, 079	3, 338, 753	11. 20	566, 441	5, 185, 627	9. 15

[1] Includes peat used for eathworm-culture medium and seed beds.

VALUE AND PRICE

The total f.o.b. plant value of peat sold by domestic producers was $5.2 million, an increase of 11 percent over the plant value of 1961. The increase in value, however, was not proportional to the increase in sales, as the average value per ton of all domestic peat sold declined by 4 percent.

The average selling price, f.o.b. plant, of domestic peat was $9.15 per ton. Prices varied greatly, however, and were dependent chiefly upon whether the peat was sold unprepared or processed and in bulk or in packages. The average plant price of bulk peat was $6.88 per ton, and packaged peat was $11.20 per ton. Individual plant prices ranged from a low of less than $2 per ton for unprepared bulk peat, to more than $80 per ton for packaged peat sold for special use. Packaged humus, sold for uses other than soil improvement, had the highest unit price—$76.58 per ton. Most of this material was finely ground and artificially dried for use as seed inoculant. Humus sold in bulk had the lowest price—$5.60 per ton. This material was sold principally by the ton or cubic yard, as extracted, for general soil improvement.

The total value of peat imported was $12.9 million. This was the sum of the value of all foreign imports, established at port of embarkation; it was about equal to the prices paid by importers, less transportation and other miscellaneous charges. In some instances, however, ocean freight and other nondutiable charges, such as marine insurance, may have been included inadvertently in the values.

The average value per ton of the peat imported was $48.07, a decrease of 8 percent from 1961, due chiefly to lower values on peat imported from Canada. The unit value of imported peat was about five times the plant value of domestic peat.

The values of foreign and domestic peats are difficult to compare because they are assigned at different marketing levels, and the two materials have different properties. Foreign peat is light and fibrous, usually is packaged in bales, and is sold on a volume basis. Most of the packaged domestic peat are finely ground or well decomposed and usually are sold by weight. As an indication of their respective densities, each 100 pounds of a typical imported peat will measure approximately 12 bushels, but 100 pounds of a typical domestic peat will measure only 3 or 4 bushels. A few domestic operations, however, produce peat with properties similar to the imported peat. A 100-pound bag of domestic reed-sedge peat can be purchased currently in the Washington, D.C., area for $1.69; a 7½-cubic-foot bale of imported peat retails for $4 or $5.

FOREIGN TRADE[3]

Imports increased 6 percent over those of 1961, but were at virtually the same level as in 1957–59.

Canada remained the principal source, shipping 80 percent of the total imported. The remainder, except for a negligible quantity from Japan and Mexico, was imported from Europe.

West Germany supplied about two-thirds of the European peat and most of the remainder came from Ireland, the Netherlands, Poland and Danzig, and Sweden. Minor quantities were imported from Belgium-Luxembourg, Denmark, Finland, France, Norway, the U.S.S.R., and the United Kingdom.

European imports declined 17 percent, chiefly because of smaller shipments from Denmark, West Germany, and the Netherlands. However, imports from Ireland and Sweden increased substantially. Approximately 98 percent of the peat imported from Europe was fertilized grade.

Imports from Canada increased 14 percent over 1961, and virtually all was fertilizer grade. Canadian shipments entered the United States principally through the Buffalo, Dakota, Michigan, St. Lawrence, Vermont, and Washington customs districts. West German imports arrived chiefly through the Florida, Maryland, Mobile, New Orleans, New York, and Philadelphia customs districts.

---

[3] Figures on imports compiled by Mae B. Price and Elsie D. Jackson, Division of Foreign Activities, Bureau of Mines, from records of the Bureau of the Census.

Imported peat was classified according to use into two grades: "poultry and stable" and "fertilizer." Data were not available on ultimate end uses, but the poultry and stable grade presumably was used for litter and the fertilizer grade for various types of soil improvement. Of the total imports, 98 percent was classified as fertilizer grade and entered the United States duty free. A duty of $0.25 per long ton was levied on poultry and stable grade peat.

Ninety-eight percent of the Canadian shipments was fertilizer grade peat, most of which was baled or packaged in paper cartons with synthetic film liners. Canadian peat is classified also by texture as coarse, medium, and fine. The coarse material is used chiefly for stable litter; medium, for poultry and small animal litter; and fine, for soil conditioning, packing, and insulation.

TABLE 8.—Peat moss imported for consumption in the United States, by kinds and by countries

Country	Poultry and stable grade		Fertilizer grade		Total	
	Short tons	Value	Short tons	Value	Short tons	Value
			1960			
North America:						
Canada	5, 593	$353, 993	151, 860	$8, 918, 092	157, 453	$9, 272, 085
Mexico	25	915	-----	-----	25	915
Total	5, 618	354, 908	151, 860	8, 918, 092	157, 478	9, 273, 000
Europe:						
Belgium-Luxembourg	-----	-----	46	3, 390	46	3, 390
Czechoslovakia	-----	-----	43	2, 186	43	2, 186
Denmark	-----	-----	5, 553	256, 204	5, 553	256, 204
Finland	-----	-----	83	2, 944	83	2, 944
Germany, West	3, 303	131, 836	80, 282	3, 108, 597	83, 585	3, 240, 433
Ireland	-----	-----	273	12, 837	273	12, 837
Netherlands	150	8, 406	7, 853	334, 498	8, 003	342, 904
Norway	-----	-----	24	5, 649	24	5, 649
Poland and Danzig	-----	-----	8, 120	332, 235	8, 120	332, 235
Sweden	-----	-----	524	29, 400	524	29, 400
United Kingdom	-----	-----	132	5, 342	132	5, 342
Total	3, 453	140, 242	102, 933	4, 093, 282	106, 386	4, 233, 524
Asia: Japan	12	2, 371	1	120	13	2, 491
Grand total	9, 083	497, 521	254, 794	13, 011, 494	263, 877	13, 509, 015
			1961			
North America:						
Canada	6, 614	478, 461	182, 176	10, 196, 741	188, 790	10, 675, 202
Mexico	80	2, 969	-----	-----	80	2, 969
Total	6, 694	481, 430	182, 176	10, 196, 741	188, 870	10, 678, 171
Europe:						
Belgium-Luxembourg	-----	-----	60	2, 885	60	2, 885
Denmark	9	400	4, 013	184, 850	4, 022	185, 250
Finland	-----	-----	72	3, 975	72	3, 975
Germany, West	1, 717	63, 327	45, 482	1, 747, 199	47, 199	1, 810. 526
Ireland	-----	-----	381	15, 371	381	15, 371
Netherlands	175	11, 062	3, 264	134, 352	3, 439	145. 414
Norway	-----	-----	40	10, 713	40	10. 713
Poland and Danzig	-----	-----	7, 583	280. 880	7, 583	280. 880
Sweden	-----	-----	508	35, 505	508	35. 505
U.S.S.R	-----	-----	175	5, 468	175	5, 468
United Kingdom	-----	-----	80	2, 440	80	2, 440
Total	1, 901	74, 789	61, 658	2, 423, 638	63, 559	2, 498, 427
Asia: Japan	8	1, 876	-----	-----	8	1, 876
Grand total	8, 603	558, 095	243, 834	12, 620, 379	252, 437	13, 178, 474

TABLE 8.—Peat moss imported for consumption in the United States, by kinds and by countries—Continued

Country	Poultry and stable grade		Fertilizer grade		Total	
	Short tons	Value	Short tons	Value	Short tons	Value
	1962					
North America:						
Canada	5, 601	389. 434	209, 266	10, 418. 008	214. 867	10. 807. 442
Mexico	58	2. 885	----------	----------	58	2, 885
Total	5, 659	392. 319	209. 266	10. 418. 008	214. 925	10. 810. 327
Europe:						
Belgium-Luxembourg	----------	----------	26	496	26	496
Denmark	----------	----------	163	5, 109	163	5, 109
Finland	----------	----------	25	919	25	919
France	----------	----------	34	1. 110	34	1, 110
Germany, West	559	20, 134	33, 972	1, 296. 940	34. 531	1, 317, 074
Ireland	----------	----------	3, 002	111. 635	3, 002	111, 635
Netherlands	104	4, 611	1, 953	76. 312	2, 057	80, 923
Norway	----------	----------	32	7, 912	32	7, 912
Poland and Danzig	----------	----------	8. 531	335, 200	8. 531	335, 200
Sweden	----------	----------	3, 624	169. 171	3, 624	169, 171
U.S.S.R	----------	----------	525	17, 834	525	17, 834
United Kingdom	----------	----------	194	7, 255	194	7, 255
Total	663	24, 745	52, 081	2, 029, 893	52, 744	2, 054. 638
Asia: Japan	9	3. 203	----------	----------	9	3, 203
Grand total	6, 331	420. 267	261, 347	12, 447, 901	267, 678	12, 868. 168

Source: Bureau of the Census.

TABLE 9.—Peat moss imported for consumption in the United States in 1962, by kinds and by customs districts

Customs district	Poultry and stable grade		Fertilizer grade		Total	
	Short tons	Value	Short tons	Value	Short tons	Value
Buffalo	43	$2, 052	33, 502	$1, 494, 243	33, 545	$1, 496. 295
Chicago	----------	----------	83	3, 423	83	3, 423
Dakota	3, 222	255, 891	17, 897	1, 027, 144	21, 119	1, 283. 035
Duluth and Superior	46	4, 469	123	6. 574	169	11, 043
Florida	25	1, 000	8. 102	310, 160	8, 127	311, 160
Galveston	45	1. 440	1, 793	49, 736	1, 838	51, 176
Georgia	----------	----------	431	15, 229	431	15, 229
Hawaii	9	3. 203	----------	----------	9	3, 203
Laredo	58	2, 885	106	3, 722	164	6, 607
Los Angeles	----------	----------	1, 891	94, 718	1, 891	94. 718
Maine and New Hampshire	28	1, 228	2. 449	107. 724	2, 477	108. 952
Maryland	137	4, 889	4, 805	203, 494	4, 942	208. 383
Massachusetts	----------	----------	1, 932	74. 005	1, 932	74, 005
Michigan	693	35, 740	22, 525	1, 019, 517	23, 218	1, 055, 257
Minnesota	----------	----------	14	721	14	721
Mobile	----------	----------	3, 849	175, 265	3, 849	175, 265
Montana and Idaho	----------	----------	67	4, 291	67	4. 291
New Orleans	147	4, 477	4, 947	184, 210	5, 094	188, 687
New York	214	9, 643	12, 294	461. 808	12, 508	471, 451
North Carolina	30	900	255	8. 075	285	8, 975
Ohio	19	613	187	8, 679	206	9, 292
Oregon	----------	----------	65	1, 833	65	1, 833
Philadelphia	24	950	6, 162	233. 947	6, 186	234, 897
Puerto Rico	----------	----------	117	7, 244	117	7, 244
St. Lawrence	258	11, 251	22, 167	815, 137	22, 425	826, 388
San Francisco	----------	----------	471	16, 131	471	16, 131
South Carolina	----------	----------	924	37, 281	924	37, 281
Vermont	507	20, 343	41, 356	1, 615, 213	41, 863	1, 635. 556
Virginia	22	833	3, 510	135, 147	3. 532	135. 980
Washington	804	58, 460	69, 195	4, 328. 384	69, 999	4, 386. 844
Wisconsin	----------	----------	128	4, 846	128	4, 846
Total	6, 331	420, 267	261, 347	12, 447, 901	267, 678	12, 868, 168

Source: Bureau of the Census.

TABLE 10.—Peat moss imported from Canada and West Germany for consumption in the United States in 1962, by kinds and by customs districts

Customs district	Canada				West Germany			
	Poultry and stable grade		Fertilizer grade		Poultry and stable grade		Fertilizer grade	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Buffalo	43	$2, 052	33, 502	$1, 494, 243	--------	--------	--------	--------
Chicago	--------	--------	--------	--------	--------	--------	83	$3, 423
Dakota	3, 222	255, 891	17, 897	1, 027, 144	--------	--------	--------	--------
Duluth and Superior	46	4, 469	123	6, 574	--------	--------	--------	--------
Florida	--------	--------	--------	--------	25	$1, 000	7, 483	278, 982
Galveston	--------	--------	--------	--------	45	1, 440	1, 643	43, 867
Georgia	--------	--------	--------	--------	--------	--------	382	14, 286
Laredo	--------	--------	--------	--------	--------	--------	79	2, 818
Los Angeles	--------	--------	--------	--------	--------	--------	1, 434	66, 127
Maine and New Hampshire	28	1, 228	2, 449	107, 724	--------	--------	--------	--------
Maryland	--------	--------	--------	--------	137	4, 889	2, 478	96, 915
Massachusetts	--------	--------	--------	--------	--------	--------	219	6, 388
Michigan	693	35, 740	22, 496	1, 018, 577	--------	--------	29	940
Minnesota	--------	--------	14	721	--------	--------	--------	--------
Mobile	--------	--------	--------	--------	--------	--------	3, 084	132, 411
Montana and Idaho	--------	--------	67	4, 291	--------	--------	--------	--------
New Orleans	--------	--------	--------	--------	147	4. 477	3. 287	118, 761
New York	--------	--------	--------	--------	110	5, 032	6, 102	229, 522
North Carolina	--------	--------	--------	--------	30	900	175	6, 398
Ohio	--------	--------	--------	--------	19	613	187	8, 679
Oregon	--------	--------	--------	--------	--------	--------	65	1, 833
Philadelphia	--------	--------	--------	--------	24	950	3, 907	153, 669
Puerto Rico	--------	--------	--------	--------	--------	--------	117	7, 244
St. Lawrence	258	11, 251	22, 167	815, 137	--------	--------	--------	--------
San Francisco	--------	--------	--------	--------	--------	--------	471	16, 131
South Carolina	--------	--------	--------	--------	--------	--------	924	37, 281
Vermont	507	20, 343	41, 356	1, 615, 213	--------	--------	--------	--------
Virginia	--------	--------	--------	--------	22	833	1, 695	66, 419
Washington	804	58, 460	69, 195	4, 328, 384	--------	--------	--------	--------
Wisconsin	--------	--------	--------	--------	--------	--------	128	4, 846
Total	5, 601	389, 434	209, 266	10, 418, 008	559	20, 134	33, 972	1, 296, 940

Source: Bureau of the Census.

TECHNOLOGY

Research conducted in the U.S.S.R.[4] in 1961 on the use of peat and peat coke in metallurgical processes has established that peat is a satisfactory carbonaceous raw material for some metallurgical applications and, in some instances, it is superior to lump coke and coke breeze. Pilot plant studies conducted at the Cherepovets Metallurgical Plant showed that peat coke, 0.6 to 5 millimeters in diameter, can partially replace other coke or breeze normally used for agglomerating ores. In these tests, in which 30 to 35 percent of anthracite coke breeze was replaced by peat coke, plant output increased from 5 to 7 percent, and the quality of the agglomerate, relative to mechanical strength and sieve fractions, remained unchanged. The tests also showed that fine-grained coke obtained from peat raises the indices of agglomeration substantially in comparison with ground lump coke.

Other tests, conducted at the Zaporozh'ye Plant of Ferroalloys, U.S.S.R., investigated the properties of lump-peat coke and compared the use of peat coke with metallurgical coke breeze in the electric smelting of ferroalloys. These tests established that peat coke is an active carbonaceous reductant for producing ferroalloys in low-shaft electric furnaces, and its reducing properties are similar to those of wood charcoal, the ideal material for such processes. The production of ferroalloys, however, requires peat coke of 5 to 25 millimeters in size. From these tests it was determined also that peat coke, because of its specific electrical resistance and reaction capability, can be used effectively in other electrothermal processes.

---

[4] Torfyanaya Promyshlennost' (Peat Industry), Moscow, No. 4, April 1962, pp. 37–38.

A novel use for peat, which reports claim to have been developed in Finland, is the manufacture of planting pots called "FinnPots." Details of the process were not available, but the pots appear to be produced in moulds from finely divided peat. Many pots are joined together, indicating that they probably were produced in a single mould. The pots hold moisture and do not deteriorate, and plants can easily be removed for transplanting. Ireland also is producing similar planting pots. Reports indicate that the Irish pots are made from peat moss combined with wood fibers and chemical nutrients, but further details were not revealed.

Another development in Finland is a method for producing peat in fertilized and compressed sheet form. The sheets, called peat boards, are 16 by 24 inches, and are used primarily for seedlings, cuttings, and plants in greenhouses. Compressed peat boards are clean and easy to handle and, when plants are ready for transplanting, they can easily be removed.

A process for using peat as a substitute for coke in the production of metal castings has been developed in England. No details were available, but it was reported that superior castings are produced when finely ground peat, treated with caustic soda, is substituted for coke in the sand used for casting moulds.

WORLD REVIEW

Total production of peat in the world in 1962 was estimated at 169.7 million short tons, all of which except about 1 million tons was produced in Europe.

The U.S.S.R. was the world's largest producer, with fuel peat output estimated at 60.6 million tons, and agricultural peat, estimated at 100 million tons. Because of a chronic shortage of other fuels in certain areas of the U.S.S.R., peat long has been used for fuel, and a peat industry has been established that currently supplies an estimated 5 percent of the total fuel consumed in the Soviet Union. Peat is used for fuel by various industries in the U.S.S.R., but its major use is for generating electric power. Current data were not available, however, it was reported in 1957 that electric powerplants consumed 24 million tons of fuel peat, 40 percent of the total produced, and that the installed capacity of peat-fired power stations approached 2,000 megawatts. Not only separate power stations, but a number of power grids that supply whole regions and Republics, such as the Ivanovo, Yaroslavl, Kalinen, White Russia, Lithuania, Kirov, and Briansk power grids, operate entirely on peat. A number of main power stations in the Gorky, Leningrad, and Moscow districts also operate on peat. In the Latvian Republic, the Riga power station operates on peat. Efficient peat-burning euipment also has been developed, and reports indicate that some stations currently produce 1 kilowatt-hour of electricity for each 3¼ pounds of peat burned.

Peat is used also in the U.S.S.R. as an industrial fuel, and the Ministry for Power Stations supplies peat to about 80 industrial enterprises belonging to other Ministries and Departments, including such giants as the Ural Plant of Heavy Industry, the Ural Car Plant, and the Novotruby Plant. Peat also is converted into industrial gases, and briquetted for residential heating.

Large quantities of peat, estimated at 100 million tons annually, are used for agricultural purposes in the U.S.S.R. This peat is used principally on farms as a soil amendment for sandy soils, although some is used first for stable litter before it is applied to the soil as a conditioner and fertilizer.

Ireland, with an output of 4 million tons, ranked second in world production. The peat industry in Ireland also is highly developed, and large quantities are used for fuel, particularly for generating electric power. Ireland's peat output is controlled by Bord na Mona, a government organization that has established a highly mechanized peat industry which currently supplies fuel for producing about one-third of the country's electric power requirements and several hundred thousand tons of briquets annually. Bord na Mona objectives call for the annual production of 1 million tons of sod peat and 2.5 million tons of milled peat. Sod peat is used chiefly by two of the earlier power stations and for domestic and industrial heating. Milled peat is used in newer powerplants and briquetted. In addition to fuel peat, Ireland produced 24,000 tons of moss peat for agricultural use. Virtually all was baled and exported.

West Germany, the third leading producer, had an output of 1.7 million tons, of which about one-half was fuel peat and the remainder, agricultural peat. Most of the German fuel peat was used in the producing areas for industrial and domestic heating, but some peat is used also for electric power generation. Agricultural peat is produced both for soil improvement and for litter, and large quantities of moss peat are baled for domestic use and for export. About 4 percent of the agricultural peat produced in West Germany in 1962 was exported to the United States.

The United States, East Germany, the Netherlands, Sweden, Canada, Norway, Poland, Finland, and the Republic of Korea ranked next in the order named. All produced more than 100,000 tons. Six other countries produced smaller quantities. The United States, with 572,000 tons of production, had the fourth largest output.

TABLE 11.—World production of peat, by countries[1]

(Thousand short tons)

Country	1958	1959	1960	1961	1962
Argentina	2	3	[2] 3	[2] 3	[2] 3
Austria, fuel [2]	45	40	40	40	40
Canada, agricultural use [3]	150	184	185	224	233
Denmark	424	463	187	125	67
Finland:					
Agricultural use	2	1	6	4	[2] 6
Fuel	162	151	132	116	[2] 116
France: [2]					
Agricultural use	36	31	19	33	33
Fuel	6	3	2	3	3
Germany:					
East [2]	550	550	550	550	550
West:					
Agricultural use	819	931	895	577	[2] 850
Fuel	649	972	871	830	[2] 880
Hungary [2]	65	65	65	65	65
Ireland:					
Agricultural use	9	13	14	19	24
Fuel	2,491	4,805	4,514	[2] 4,400	4,198
Israel, agricultural use [2]	28	44	50	55	55
Japan [2]	80	80	80	80	80
Korea, Republic of, agricultural use	141	99	107	45	[2] 110
Netherlands [2]	500	500	500	500	500
Norway:					
Agricultural use	[2] 33	55	42	50	[2] 50
Fuel	257	235	198	180	160
Poland	137	123	125	83	[2] 130
Sweden:					
Agricultural use	69	69	[2] 70	[2] 70	[2] 70
Fuel	281	267	[2] 275	[2] 275	[2] 275
U.S.S.R.:					
Agricultural use [2]	100,000	100,000	100,000	100,000	100,000
Fuel	58,750	66,700	59,100	57,300	[2] 60,600
United States, agricultural use	328	419	471	531	572
World total [2] [4]	166,000	176,800	168,500	166,200	169,700
Fuel peat (included in world total) [2] [3] [4]	62,920	73,450	65,410	63,420	66,550

[1] Includes revisions of data published previously and estimates for agricultural peat in the U.S.S.R.
[2] Estimate.
[3] In addition, Canada produced a negligible quantity of fuel peat.
[4] In addition, Iceland, Italy, and Spain produced a negligible quantity of fuel peat.
Compiled by Pearl J. Thompson, Division of Foreign Activities.

Carbon Black

By Ivan F. Avery[1] and Lulie V. Harvey[2]

Contents

Page
General summary 309
Scope of report 310
Production and capacity 110
Consumption and uses 316
Stocks 316
Value 319
Foreign trade 319
World production 320

GENERAL SUMMARY

DOMESTIC production of carbon black increased 4 percent in 1962 to 2,056 million pounds. Furnace black output was 8 percent, or 132 million pounds, above that in 1961 and accounted for 90 percent of total carbon black production. Channel black output continued to decline and was 55 million pounds less than in 1961. Carbon black shipments during the year totaled 2,082 million pounds and were 5 percent above those of 1961. About one-fifth of these shipments were exported; the balance were sold domestically. An increase of 180 million pounds in domestic sales was partially offset by a decline of 80 million pounds in exports.

Total value of carbon black production in 1962 was $145 million. The average value per pound of 7.06 cents was 0.24 cent per pound less than in 1961. Producers' stocks declined 26 million pounds during the year.

TABLE 1.—Salient statistics of carbon black produced from natural gas and liquid hydrocarbons in the United States, 1958–62

(Thousand pounds)

	1958	1959	1960	1961	1962
Production:					
Channel process	324,743	321,030	292,422	262,507	207,438
Furnace process	1,319,862	1,646,497	1,761,305	1,717,045	1,849,026
Total	1,644,605	1,967.527	2,053,727	1,979,552	2,056,464
Shipments:					
Domestic sales	1,250.937	1,532,249	1,429.618	1,460.005	1,639.897
Exports	440,542	513,143	[1] 543.047	522,331	442,437
Total	1,691.479	2,045,392	[1] 1,972,665	1,982.336	2,082.334
Losses	1,602	4,165	[1] 6,973	2,299	370
Stocks of producers, Dec. 31	300,923	218,893	[1] 292,982	287,899	261,659
Value:					
Production thousand dollars	115,042	137.983	150,774	144,421	145.256
Average per pound cents	7.00	7.01	7.34	7.30	7.06

[1] Revised.

---

[1] Minerals specialist, Division of Petroleum.
[2] Statistical clerk, Division of Petroleum.

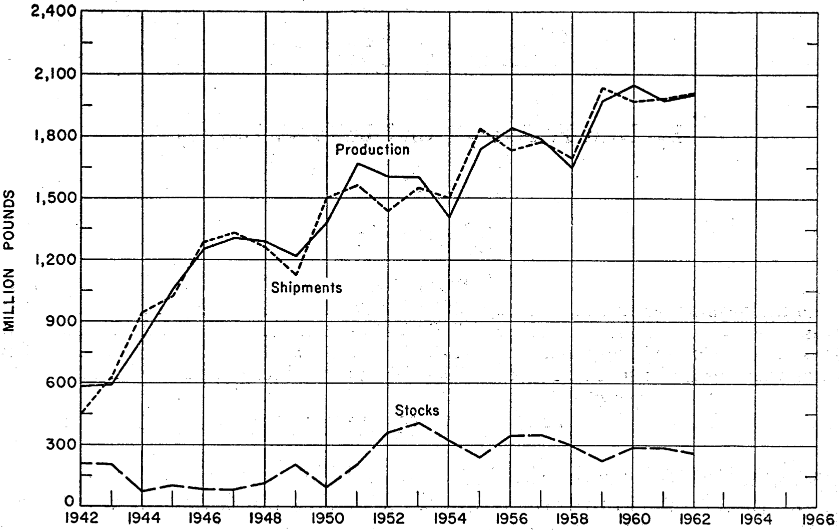


FIGURE 1.—Production, stocks, and shipments of carbon black, 1942–62.

SCOPE OF REPORT

Carbon black is a very pure grade of quasi-graphitic carbon; particle diameters range from 50 to 5,000 angstroms.

Annual reports were submitted to the Bureau of Mines by operators of all commercial plants in the United States.

Monthly figures are based on reports prepared by the National Gas Products Association and are adjusted to agree with the annual reports received by the Bureau of Mines.

Import and export data are compiled by the Bureau of the Census, U.S. Department of Commerce.

Statistics are obtained on both furnace and channel blacks. Furnace blacks are reported in eight grades: Semireinforcing furnace (SRF), high-modulus furnace (HMF), general-purpose furnace (GPF), fast-extrusion furnace (FEF), high-abrasion furnace (HAF), superabrasion furnace (SAF), intermediate-abrasion furnace (ISAF), and thermal. Production and uses of the various grades are described in Minerals Yearbook, 1948 and 1949.

PRODUCTION AND CAPACITY

Output by States and Districts.—Output of carbon black in the major producing States of Texas and Louisiana increased 3 and 4 percent, respectively, in 1962. Texas accounted for 54 percent of the total national production of 2,056 million pounds, and Louisiana, for 30 percent. Arkansas, Oklahoma, California, Kansas, and New Mexico accounted for the remaining 16 percent. The largest increase was in Texas where State output rose 36 million pounds, despite a further decline in the Texas Panhandle district.

Output and Shipments by Grades.—Furnace black output of 1,849 million pounds was 132 million pounds greater than in 1961. Among the various grades, high-abrasion furnace and intermediate-abrasion furnace together accounted for about half of total furnace black output. Channel black output continued to decline and was 55 million pounds less than in 1961. Total carbon black shipments, including exports and losses, exceeded production by 26 million pounds, resulting in a decline in stocks during the year.

Number and Capacity of Plants.—There were 41 carbon black plants operating at the end of 1962, including 11 channel black and 30 furnace black plants. The number of channel plants declined by four during the year, and the furnace plant total increased by one. Total daily capacity of all operating plants was 7,049,800 pounds, a slight increase over that of 1961. Texas with 21 plants accounted for 54 percent of total operating capacity; Louisiana with 10 plants accounted for 27 percent. The remaining 19 percent of capacity was distributed among 10 plants in the other 5 producing States.

In Texas, plant capacity decreased 85,300 pounds daily during the year. Four channel process plants closed down in the State—namely the Coltexo Corporation plant at Lefors; the two Columbian Carbon Company plants at Lefors and Sweeny; and the Cabot Corporation plant at Kermit. In New Mexico, the Continental Carbon Company channel black plant at Eunice was closed during the year. A research channel black plant was opened by the Columbian Carbon Company at Hancock, La. In California, a furnace black plant was opened by the United Carbon Company at Mojave.

Method and Yield.—During the year, 133,302 million cubic feet of natural gas and 330,399,000 gallons of liquid hydrocarbons were consumed at carbon black plants. Natural gas was used to produce 26 percent of the total carbon black production, while liquid hydrocarbons accounted for 74 percent. Furnace black plants consumed 30,480 million cubic feet of natural gas which yielded 10.80 pounds per thousand cubic feet. Gas consumption at channel black plants was 102,822 million cubic feet, with a yield of 2.02 pounds per thousand cubic feet. At furnace black plants, 330,399,000 gallons of liquid hydrocarbons was consumed as feedstock, with a yield of 4.60 pounds per gallon. The proportion of furnace black output derived from liquid hydrocarbons continued to rise; in 1962 it was 82 percent of the furnace black total, compared with 80 percent in 1961 and 70 percent in 1957. The average yield of carbon black per gallon of liquid hydrocarbons used increased from 4.18 pounds per gallon in 1957 to 4.60 pounds per gallon in 1962.

TABLE 2.—Carbon black produced from natural gas and liquid hydrocarbons in the United States, 1958–62, by States and districts

(Thousand pounds)

State and district	1958	1959	1960	1961	1962	Change from 1961 (percent)
Louisiana	502, 742	599. 523	[1] 631, 488	[1] 582. 833	[1] 608, 499	+4
Texas:						
Panhandle district	474, 564	572. 157	561. 119	524, 457	498. 157	−5
Rest of State	369, 831	450, 639	[1] 523, 737	[1] 546, 386	[1] 608, 717	+11
Total Texas	844. 395	1, 022. 796	[1] 1, 084, 856	[1] 1, 070, 843	[1] 1, 106, 874	+3
Other States	297, 468	345. 208	337, 383	325. 876	341. 091	+5
Grand total	1, 644. 605	1, 967, 527	2, 053, 727	1, 979, 552	2, 056. 464	+4

[1] Small quantity of channel black produced in Louisiana included in "Texas: Rest of State" to avoid disclosure of confidential data.

TABLE 3.—Production and shipments of carbon black in the United States in 1962, by months and grades

(Thousand pounds)

Month	Furnace									Channel	Total
	SRF [1]	HMF [2]	GPF [3]	FEF [4]	HAF [5]	SAF [6]	ISAF [7]	Thermal	Total		
					PRODUCTION [8]						
January	21,536	5,760	14,103	18,394	43,293	362	29,378	10,852	143,678	17,992	161,670
February	22,414	3,975	14,374	18,776	41,568	89	26,438	11,608	139,242	17,572	156,814
March	26,810	6,000	14,357	23,481	48,873	1,853	26,088	14,526	161,988	20,498	182,486
April	24,192	6,651	13,846	19,352	48,327	3,717	26,784	14,016	156,885	18,987	175,872
May	22,585	4,948	15,646	21,451	46,212	3,817	27,871	15,007	157,537	18,543	176,080
June	24,369	2,868	16,353	21,296	46,515	953	29,098	13,901	155,353	16,498	171,851
July	24,175	3,230	16,838	21,705	40,338	430	27,785	14,752	149.253	17,003	166,256
August	27,005	5,487	12,848	23,153	37,935	1,217	27,530	14,472	149,647	16,758	166,405
September	24,915	4,255	14,611	20,029	39,634	1,346	28,409	15,652	148,851	15,536	164,387
October	27,436	4,105	12,272	17,714	47,069	2,774	31,259	15,308	157,937	15,938	173,875
November	26,486	3,797	15,125	19,707	46,852	2,624	31,810	15,059	161,460	16,136	177,596
December	26,347	5,299	15,109	22,344	44,426	136	36,749	16,785	167,195	15,977	183,172
Total	298,270	56,375	175,482	247,402	531,042	19,318	349,199	171,938	1,849,026	207,438	2,056,464
					SHIPMENTS (INCLUDING EXPORTS) [9]						
January	26,697	5,672	14,418	23,071	45,203	1,849	29,490	14,703	161,103	29,327	190,430
February	24,466	4,487	13,050	19,397	40,869	1,492	26,305	13,982	144,048	19,840	163,888
March	24,929	6,142	13,739	19,952	48,923	1,719	27,412	15,042	157,858	19,389	177.247
April	24,616	4,824	14,273	20,356	44,927	1,844	26,880	13,111	150,831	16,025	166.856
May	28,013	5,123	16,221	22,034	48,746	1,469	31,950	16,362	169,918	19,014	188,932
June	25,697	4,217	14,572	19,994	44,619	1,351	30,885	12,562	153,897	15,947	169,844
July	24,271	3,342	12,269	18,157	39,546	1,756	27,117	12,545	139,003	15,626	154,629
August	26,566	5,136	13,222	19,474	43,962	2,333	29,466	15,805	155,964	20.015	175,979
September	24.905	5,869	14,103	17,635	42,038	1,032	28,518	15,100	149,200	16.340	165.540
October	26,491	4,262	14,585	21,879	49,115	1,247	33,153	15,692	166,424	16,968	183,392
November	26,268	4,350	14,693	20,138	41,947	1,250	35,204	14,952	158,802	18,938	177,740
December	22,960	4,770	13,778	19,970	44,584	1,626	30,511	14,766	152,965	15,262	168,227
Total	305,879	58,194	168,923	242,057	534,479	18,968	356,891	174,622	1,860,013	222,691	2,082,704

[1] Semireinforcing furnace.
[2] High-modulus furnace.
[3] General-purpose furnace.
[4] Fast-extrusion furnace.
[5] High-abrasion furnace.
[6] Superabrasion furnace.
[7] Intermediate-abrasion furnace.
[8] Compiled from reports of the National Gas Products Association and of producing companies not included in Association figures. Figures adjusted to agree with annual reports of individual producers.
[9] Includes losses.

TABLE 4.—Number and capacity of carbon black plants operated in the United States, 1961–62

State or district	County or parish	Number of plants				Total daily capacity (pounds)	
		1961		1962		1961	1962
		Channel	Furnace	Channel	Furnace		
Texas:							
Panhandle district	Carson	1	------	1	------	1,721,500	1,677,500
	Gray	3	1	1	1		
	Hutchinson	1	4	1	4		
	Moore	------	1	------	1		
	Wheeler	------	1	------	1		
Total Panhandle district	------	5	7	3	7	1,721,500	1,677,500
Rest of State	Aransas	1	1	1	1	2,143,800	2,102,500
	Brazoria	1	------	------	------		
	Brooks	1	------	1	------		
	Ector	1	------	1	------		
	Gaines	1	------	1	------		
	Harris	------	1	------	1		
	Howard	------	2	------	2		
	Montgomery	------	1	------	1		
	Orange	------	1	------	1		
	Perry	------	1	------	1		
	Winkler	1	------	------	------		
Total rest of State	------	6	7	4	7	2,143,800	2,102,500
Total Texas		11	14	7	14	3,865,300	3,780,000
Louisiana	Avoyelles	------	1	------	1	1,840,300	1,905,300
	Calcasieu	------	1	------	1		
	Evangeline	------	1	------	1		
	Ouachita	------	2	1	2		
	Richland	1	------	1	------		
	St. Mary	------	3	------	3		
Total Louisiana	------	1	8	2	8	1,840,300	1,905,300
Arkansas	Union	------	1	------	1	1,010,000	1,147,000
California	Contra Costa	------	1	------	1		
	Kern	------	1	------	2		
Kansas	Grant	------	2	------	2		
Oklahoma	Kay	------	1	------	1		
New Mexico	Lea	3	1	2	1	319,000	217,500
Total United States	------	15	29	11	30	7,034,600	7,049,800

TABLE 5.—Carbon black produced in the United States, 1962, by States and districts, and natural gas and liquid hydrocarbons used in its manufacture

State or district	Producers reporting[1]	Number of plants	Production					
			Furnace black			Channel black		
			Thousand pounds	Value at plant		Thousand pounds	Value at plant	
				Total (thousand dollars)	Cents per pound		Total (thousand dollars)	Cents per pound
Louisiana	6	10	608,499	37,816	6.21	([2])	([2])	([2])
Texas:								
Panhandle district	6	10	441,011	27,465	6.23	57,146	9,480	16.59
Rest of State	6	11	502,643	35,948	7.15	[2] 106,074	[2] 10,429	[2] 9.83
Total Texas	7	21	943,654	63,413	--------	[2] 163,220	[2] 19,909	[2] 12.20
Arkansas	1	1						
Oklahoma	1	1	218,008	15,835	7.26	--------	--------	--------
Kansas	2	2						
California	3	3	55,377	2,953	5.33	--------	--------	--------
New Mexico	3	3	23,488	1,097	4.67	44,218	4,233	9.57
Grand total:								
1962	10	41	1,849,026	121,114	6.55	207,438	24,142	11.64
1961	11	44	1,717,045	117,474	6.84	262,507	26,947	10.27

State or district	Natural gas used					Liquid hydrocarbons used			
	Million cubic feet	Average yield[3] (pounds per Mcf)		Value		Thousand gallons	Average yield (pounds per gallon)	Value	
		Furnace	Channel	Total (thousand dollars)	Average (cents per Mcf)			Total (thousand dollars)	Average (cents per gallon)
Louisiana	17,992	12.77	0.41	2,455	13,64	83,125	4.58	5,965	7.18
Texas:									
Panhandle district	36,393	7.14	1.92	4,059	11.15	85,385	4.61	5,990	7.02
Rest of State	48,181	--------	2.20	5,279	10.96	106,092	4.74	6,952	6.55
Total Texas	84,574	7.14	2.09	9,338	11.04	191,477	4.68	12,942	6.76
Arkansas	--------	--------	--------	--------	--------				
Oklahoma	--------	--------	--------	--------	--------	55,797	4.34	3,265	5.85
Kansas	3,776	8.27	--------	1,005	26.62				
California									
New Mexico	26,960	10.15	1.79	2,203	8.17	--------	--------	--------	--------
Grand total:									
1962	133,302	10.80	2.02	15,001	11.25	330,399	4.60	22,172	6.71
1961	161,377	9.99	2.05	16,728	10.37	307,637	4.49	21,586	7.02

[1] Detail does not add to total because some producers operate in more than 1 area.

[2] Included with "Texas: Rest of State" to avoid disclosure of confidential data.

[3] Partly estimated.

TABLE 6.—Natural gas and liquid hydrocarbons used in manufacturing carbon black in the United States and average yield, 1958–62

	1958	1959	1960	1961	1962
Natural gas used…million cubic feet	211,048	214,612	197,628	161,377	133,302
Average yield of carbon black per thousand cubic feet…pounds	3.32	3.31	3.23	3.71	4.03
Average value of natural gas used per thousand cubic feet…cents	8.44	9.19	10.05	10.37	11.25
Liquid hydrocarbons used…thousand gallons	231,057	297,639	313,020	307,637	330,399
Average yield of carbon black per gallon…pounds	4.09	4.22	4.52	4.49	4.60
Average value of liquid hydrocarbons used per gallon…cents	6.79	6.74	7.05	7.02	6.17
Number of producers reporting	11	11	11	11	01
Number of plants	41	41	42	44	14

CONSUMPTION AND USES

The rubber industry accounted for 95 percent of total sales of 1,640 million pounds of carbon black in 1962. Sales for use by the ink and paint industries remained at about the 1961 level, while sales for miscellaneous uses increased by over two-thirds. Principal miscellaneous uses during the year were for plastics, 7,720,000 pounds; chemicals, 6,776,000 pounds; and paper, 4,620,000 pounds. Metals, fertilizers, cement, and the shoe industry consumed the balance of 12,649,000 pounds. The average loading of carbon black in virgin rubber, which includes both natural and synthetic rubbers, decreased slightly to 894 pounds per long ton in 1962, compared with 897 pounds in 1961.

TABLE 7.—Sales of carbon black for domestic consumption in the United States, 1958–62, by uses

(Thousand pounds)

Uses	1958	1959	1960	1961	1962	Change from 1961 (percent)
Rubber	1,192,162	1,463,239	1,362,912	1,382,893	1,551,204	+12
Ink	40,645	47,366	47,980	42,987	41,162	−4
Paint	10,997	13,828	12,270	15,267	15,766	+3
Miscellaneous	7,133	7,816	6,456	18,858	31,765	+68
Total	1,250,937	1,532,249	1,429,618	1,460,005	1,639,897	+12

STOCKS

Total stocks of carbon black decreased 26 million pounds in 1962. Stocks of furnace black declined about 11 million pounds, and stocks of channel black, 15 million pounds. There were declines in most of the grades of furnace black, except for general-purpose furnace black and fast-extrusion furnace black, which increased.

TABLE 8.—Producers' stocks of channel- and furnace-type blacks in the United States, December 31, 1958–62

(Thousand pounds)

Year	Furnace									Channel	Total
	SRF[1]	HMF[1]	GPF[1]	FEF[1]	HAF[1]	SAF[1]	ISAF[1]	Thermal	Total		
1958	40, 391	6, 351	8, 867	26, 526	53, 007	7, 045	40, 451	23, 276	205, 914	95, 009	300, 923
1959	24, 917	4, 757	4, 132	18, 413	40, 281	6, 786	29, 044	20, 800	149, 130	69, 763	218, 893
1960	43, 402	12, 050	7, 827	23, 420	66, 325	4, 437	39, 075	23, 032	219, 568	73, 424	292, 992
1960[2]	43, 402	11, 040	8, 827	23, 420	66, 325	4, 437	39, 075	23, 032	219, 558	73, 424	292, 982
1961	41, 171	7, 694	9, 055	22, 069	69, 799	8, 510	62, 728	16, 229	237, 255	50, 644	287, 899
1962	33, 562	5, 875	15, 614	27, 414	66, 362	8, 860	55, 036	13, 545	226, 268	35, 391	261, 659

[1] For explanation, see footnotes to table 3.
[2] Reclassification of grades.

VALUE

The average value of furnace black at plants declined slightly from 6.84 cents per pound in 1961 to 6.55 in 1962. Conversely, channel black value increased from 10.27 cents per pound to 11.64 cents per pound in 1962. Average value of natural gas used as feedstock in carbon black production rose by 0.88 cent per thousand cubic feet to 11.25 cents, while the value of liquid hydrocarbons used increased by 0.31 cent per gallon to 6.71 cents. Prices of channel black, as reported in the Oil, Paint and Drug Reporter, remained steady during the year. Reported prices for the various grades of furnace black were reduced 0.25 cent per pound on May 14, 1962.

TABLE 9.—Prices of carbon black in carlots, f.o.b. plant, 1958–62

(Cents per pound)

Date	Channel blacks, ordinary rubber grades[1]		Furnace blacks (bags)			
	Bags	Bulk	Semireinforcing grades (SRF)	High-modulus grades (HMF)	Fast-extrusion grades (FEF)	High-abrasion grades (HAF)
Dec. 29, 1958	7. 75	7. 25	5. 75	6. 25	6. 75	7. 75
Dec. 28, 1959	7. 75	7. 25	5. 75	6. 25	6. 75	7. 75
Feb. 8, 1960	8. 50	8. 00	5. 75	6. 25	6. 75	7. 75
Oct. 17, 1960	8. 50	8. 00	5. 75	6. 25	8. 75	7. 75
Apr. 10, 1961	8. 50	8. 00	5. 75	8. 25	8. 75	7. 75
Oct. 9, 1961	8. 50	8. 00	5. 75	6. 25	6. 75	7. 75
Feb. 5, 1962	9. 00	8. 75	5. 75	6. 25	6. 75	7. 75
May 14, 1962	9. 00	8. 75	5. 50	6. 00	6. 50	7. 50

[1] Chiefly easy-processing (EPC) and medium-processing (MPC), but also includes hard-processing (HPC) and conductive (CC) channel blacks.

Source: Oil, Paint and Drug Reporter.

FOREIGN TRADE

Imports.—Imports of acetylene black decreased from 8,074,000 pounds in 1961 to 7,883,000 pounds in 1962. Most of these imports came from Canada. The average value of imports, as reported by the Bureau of the Census, declined from 18.4 cents per pound in 1961 to 17.6 cents per pound in 1962.

Exports.—Total exports of carbon black decreased by 79,894,000 pounds in 1962 to 442,437,000 pounds. Furnace black exports were down 53,820,000 pounds from the 1961 level and channel black exports were down 26,074,000 pounds. The substantial decline in exports during 1962 was due to the expanding production of carbon black in foreign countries.

TABLE 10.—U.S. exports of carbon black, 1962, by months
(Thousand pounds)

Month	Channel	Furnace	Total	Month	Channel	Furnace	Total
January	13, 027	27, 174	40, 201	September	13, 654	34, 855	48, 509
February	14, 817	27, 010	41, 827	October	5, 594	15, 552	21, 146
March	9, 388	32, 727	42, 115	November	9, 213	19, 504	28, 717
April	8, 745	28, 480	37, 225	December	7, 738	26, 307	34, 045
May	9, 431	26, 024	35, 455				
June	7, 967	39, 083	47, 050	Total: 1962	115, 676	326, 761	442, 437
July	8, 513	22, 474	30, 987	1961	141, 750	380, 581	522, 331
August	7, 589	27, 571	35, 160				

Source: Bureau of the Census.

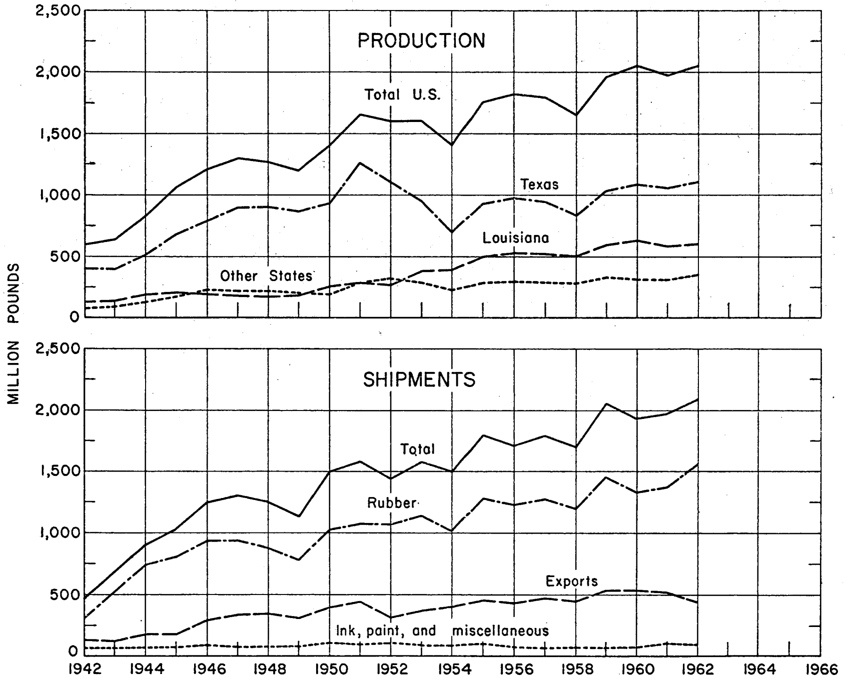


FIGURE 2.—Production and shipments of carbon black, 1942–62.

TABLE 11.—U.S. exports of carbon black, by countries

Destination	1960		1961		1962	
	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars	Thousand pounds	Thousand dollars
North America:						
Canada	27,174	2,285	19,722	1,712	25,540	2,177
Cuba	2,003	164	------	------	------	------
Guatemala	826	75	815	71	701	62
Mexico	20,571	1,728	20,273	1,652	24,245	1,920
Other North America	124	10	72	10	16	4
Total	50,698	4,262	40,882	3,445	50,502	4,163
South America:						
Argentina	20,183	1,768	29,798	2,634	24,974	2,133
Brazil	12,930	1,085	12,021	1,011	12,777	1,022
Chile	3,554	313	3,361	299	2,926	255
Colombia	8,769	772	8,057	721	9,535	848
Peru	3,928	356	3,858	344	3,890	336
Uruguay	3,667	307	1,227	105	2,094	184
Venezuela	10,020	906	11,100	1,006	9,979	865
Other South America	315	37	464	46	237	22
Total	63,366	5,544	69,886	6,166	66,412	5,665
Europe:						
Austria	1,457	119	2,032	157	2,097	160
Belgium-Luxembourg	13,326	1,222	12,899	1,173	8,890	808
Czechoslovakia	352	38	1,091	101	110	11
Denmark	3,229	315	3,552	323	1,506	194
Finland	738	73	1,329	118	1,571	144
France	67,981	6,278	55,215	5,242	48,474	4,842
Germany, West	44,503	3,790	51,184	4,331	48,543	4,120
Greece	267	26	505	43	394	31
Ireland	101	22	25	3	128	21
Italy	71,336	6,348	65,528	5,887	47,206	4,369
Netherlands	9,950	1,058	8,246	818	8,089	796
Norway	1,852	162	2,076	187	1,781	159
Poland and Danzig	1,004	84	13	2	4	1
Portugal	1,974	171	2,290	211	1,744	169
Spain	9,645	855	8,189	735	5,921	582
Sweden	14,544	1,320	10,693	1,005	6,780	622
Switzerland	1,751	190	3,554	347	1,440	157
Trieste	------	------	198	15	67	5
U.S.S.R.	4,496	404	9,370	828	------	------
United Kingdom	29,228	3,563	26,155	3,361	23,576	3,180
Yugoslavia	3,284	315	4,664	414	1,577	159
Other Europe	65	18	45	4	84	14
Total	281,083	26,371	268,853	25,305	209,982	20,544
Asia:						
India	22,941	1,939	31,400	2,669	39,409	3,300
Indonesia	6,605	584	7,143	649	2,822	1,000
Iran	301	26	1,635	142	1,037	87
Israel	4,913	426	4,738	395	5,685	477
Japan	47,537	4,650	41,574	4,325	18,241	2,162
Korea, Republic of	2,386	229	2,873	272	6,048	573
Malaya, Federation of	1,026	96	1,248	116	1,083	102
Singapore	544	51	534	50	427	41
Pakistan	643	62	705	66	648	61
Philippines	8,194	755	7,587	695	7,462	673
Taiwan	1,353	129	1,407	126	2,646	234
Turkey	1,632	139	1,305	112	2,977	240
Other Asia	2,018	194	2,733	280	1,905	201
Total	100,093	9,280	104,882	9,897	90,390	9,151
Africa:						
South Africa, Republic of[1]	24,081	2,147	20,812	1,840	11,860	1,002
United Arab Republic (Egypt Region)	1,631	133	2,303	205	62	6
Other Africa	841	77	873	84	977	96
Total	26,553	2,357	23,988	2,129	12,899	1,104
Oceania:						
Australia	16,581	1,376	8,473	750	8,615	854
New Zealand	4,673	412	5,367	474	3,637	320
Total	21,254	1,788	13,840	1,224	12,252	1,174
Grand total	543,047	49,602	522,331	48,166	442,437	41,801

[1] Effective Jan. 1, 1962, formerly Union of South Africa.

Source: Bureau of the Census.

WORLD PRODUCTION

TABLE 12.—World production of carbon black by countries[1] [2]
(Thousand pounds)

Country[1]	1958	1959	1960	1961	1962
Brazil	18.739	25,353	35,274	37,478	43,430
France	39,700	68,800	[3] 77,000	[3] 154,300	(4)
Germany, West	141,429	139,582	154,878	173,462	[3] 181,500
Italy	4,015	4,627	17,637	4,896	(4)
Japan	31,662	42,300	55,093	92,245	147,095
Rumania	49,116	49,235	55,186	62,589	(4)
South Africa, Republic of	----------	----------	----------	4,123	16,840
Sweden	6,027	7,430	(4)	(4)	(4)
Taiwan	603	455	310	676	453
United Kingdom	243,936	269,069	320,317	301,054	282,462
United States	1,644,605	1,967,527	2,053,727	1,979,552	2,056,464
Yugoslavia	4,934	6,440	8,514	9,696	8,234

[1] Australia, China, India, Mexico, the Netherlands, and Venezuela produce carbon black, but production data are not available. Canada's carbon black capacity was increased late in 1961 to about 100 million pounds annually, from 2 producers. Actual production is not published to avoid disclosure of individual company data.

[2] This table incorporates some revisions.

[3] Estimate.

[4] Data not available.

Natural Gas

By Ivan F. Avery [1] and Lulie V. Harvey [2]

◆

Contents

	Page
General summary	321
Scope of report	322
Reserves	322
Gross withdrawal	323
Underground storage of natural gas	323
Interstate shipments, imports, and exports	328
Pipelines	332
Consumption	332
Value and price	340
World production	341

GENERAL SUMMARY

THE NATURAL GAS INDUSTRY continued its unbroken record of progress and expansion during 1962. Marketed production was at an all time high of 13,877 billion cubic feet, a 5 percent increase over 1961. The average value at the wellhead was 15.5 cents per thousand cubic feet, 0.4 cent per thousand more than in 1961.

Natural gas was consumed in all States except Maine, Vermont, and Hawaii. Total consumption was 13,890 billion cubic feet, an increase of 6 percent for the year. Exceptionally cold weather in most of the Nation caused heavy demands for natural gas. As a result only 86 billion cubic feet was added to underground storage, which was the lowest increase since 1958.

The average value at point of consumption of 51.4 cents per thousand cubic feet was also an increase of 0.4 cent.

---

[1] Supervisory mineral specialist (petroleum).
[2] Statistical clerk.

TABLE 1.—Salient statistics of natural gas in the United States

	1958	1959	1960	1961	1962
Supply:					
Marketed production [1] million cubic feet	[2] 11,030,298	12,046,115	12,771,038	13,254,025	13,876,622
Withdrawn from storage do	621,091	668,743	712,658	698,050	854,336
Imports do	135,797	133,990	155,646	218,860	401,534
Total do	11,787,186	12,848,848	12,639,342	14,170,935	15,132,492
Disposition:					
Consumption do	[2] 10,760,698	11,819,638	12,509,427	13,081,714	13,890,129
Exports do	38,719	18,413	11,332	10,747	15,814
Stored do	704,172	787,485	844,352	843,666	940,823
Lost in transmission, etc do	283,597	223,312	274,231	234,808	285,726
Total do	11,787,186	12,848,848	13,639,342	14,170,935	15,132,492
Value at wellhead:					
Total thousand dollars	[2] 1,317,492	1,556,800	1,789,970	1,996,241	2,145,301
Average cents per Mcf	11.9	12.9	14.0	15.1	15.5

[1] Comprises gas sold or consumed by products, including losses in transmission, amounts added to storage, and increases in gas in pipelines.

[2] Includes 50 million cubic feet produced in Alaska with a value of $6,000.

SCOPE OF REPORT

Data on natural gas production, consumption, and value are collected by annual questionnaires sent to oil and gas producers, natural-gasoline-plant operators, gas-pipeline companies, and gas-utility companies. A separate report was filed by the respondent for each State in which he operated.

Volumes are reported at the pressure base selected by the reporting company; however, if the reported pressure base deviates more than 5 percent from 14.65 pounds per square inch absolute at 60° F., volumes are corrected to this base.

Reports are received covering approximately 75 percent of the gross natural gas production. The large number of respondents and the difficulty of contacting each small producer make direct compilation of total production impractical. The bulk of the output of nonreporting producers is shown in purchase listings of reporting companies. Marketed production for each State equals consumption in the State, plus gas placed in storage, plus shipments to other States, less gas withdrawn from storage, less receipts from other States.

RESERVES

It is significant that the estimated proved reserves of natural gas in the United States have almost doubled since 1945. At the end of 1962, proved reserves of natural gas were 273.8 trillion cubic feet, according to the American Gas Association Committee on Natural Gas Reserves. This was an increase of 6.1 trillion over 1961. Nonassociated gas comprised 73 percent of the total reserves, associated and dissolved gas, 26 percent, and the remaining 1 percent represented gas in underground storage. Proved reserves of natural gas are located in 31 States. The west south central States—Texas with 119.5 trillion cubic feet, Louisiana with 71.9 trillion, Oklahoma with 18.4 trillion, and Arkansas with 1.7 trillion—account for over 77 percent of the total reserves of the United States.

GROSS WITHDRAWAL

Gross withdrawal of natural gas in 1962 was 16,039 billion cubic feet, a 4 percent increase for the year. This figure represents the sum of marketed production, gas repressured, and vented and wasted. The quantity of gas vented and wasted is compiled from company data reported to the Bureau of Mines, and is supplemented by estimates of waste derived from figures published by the Natural Gas Reserves Committee of the American Gas Association and State conservation bodies. Because of better reporting by respondents in Oklahoma, gas vented and wasted in 1962 showed a decline of 19 percent. Repressuring increased 3 percent over 1961 to 1,737 billion cubic feet in 1962.

UNDERGROUND STORAGE OF NATURAL GAS

Gross injections to underground storage in 1962 were 941 billion cubic feet, and withdrawals totaled 854 billion cubic feet. The resulting net increase in storage of 86 billion cubic feet for the year was the smallest increase since 1958. Storage reservoirs as of December 31 were filled to 71 percent capacity compared to 75 percent in 1961.

The American Gas Association reports that during 1962, 29 storage pools and 904 no-longer-producing wells were added to existing underground storage facilities, bringing the total of such facilities to 258 storage pools and 10,521 wells. The total capacity of underground natural gas storage facilities is now 3,504 billion cubic feet. Underground storage facilities exist in 21 States.

TABLE 2.—Estimated proved recoverable reserves of natural gas in the United States

(million cubic feet)

State	Reserves as of Dec. 31, 1961[1]	Changes in reserves during 1962			
		Extensions and revisions[1]	Discoveries of new fields and new pools in old fields[1]	Net change in underground storage[2]	Net production[3]
Alaska	926, 829	615, 000	105, 000	0	3, 584
Arkansas	1, 476, 992	234, 040	14, 581	660	73, 628
California[4]	9, 103, 613	361, 677	222, 634	29, 721	546, 456
Colorado	2, 170, 716	111, 870	20, 180	117	86, 065
Illinois	164, 185	—41, 351	1, 246	44, 711	9, 717
Indiana	32, 273	1, 441	238	19, 540	3, 585
Kansas	19, 190, 005	177, 939	32, 017	8, 583	739, 983
Kentucky	1, 126, 778	43, 784	8, 650	—245	63, 969
Louisiana[4]	66, 028, 670	7, 200, 857	2, 279, 286	0	3, 574, 047
Michigan	666, 664	—1, 551	4, 880	8, 071	27, 504
Mississippi	2, 847, 989	5, 328	72, 010	705	175, 247
Montana	596, 337	4, 109	4, 982	28, 636	30, 619
Nebraska	104, 282	9, 828	1, 189	0	14, 558
New Mexico	14, 757, 739	54, 006	108, 974	—1, 634	729, 288
New York	128, 324	3, 457	3, 820	331	4, 023
North Dakota	948, 531	44, 889	200	0	25, 654
Ohio	733, 837	35, 000	7, 500	—7, 132	37, 330
Oklahoma	17, 350, 924	1, 567, 182	462, 997	13, 105	1, 035, 470
Pennsylvania	1, 168, 855	84, 983	18, 048	—3, 093	87. 308
Texas[4]	119, 838, 711	2, 771, 879	2, 845, 522	10, 519	5, 962, 833
Utah	2, 030, 160	—189, 789	34, 736	39	79, 026
Virginia	34, 062	1, 541	0	0	2, 378
West Virginia	2, 019, 002	178, 979	25, 280	—5, 832	180, 376
Wyoming	4, 127, 048	—18, 467	59, 132	663	215, 685
Other States[5]	155, 145	160	460	12, 560	4, 112
Total	267, 727, 671	13, 256, 791	6, 333, 562	160, 025	13, 712, 445

State	Non-associated[6]	Reserves as of Dec. 31, 1962			
		Associated[7]	Dissolved[8]	Underground storage[9]	Total
Alaska	1, 576, 551	0	66, 694	0	1, 643, 245
Arkansas	1, 182, 059	275, 071	189, 927	5, 588	1, 652, 645
California[4]	3, 251, 780	1, 827, 100	3, 927, 592	164, 717	9, 171, 189
Colorado	1, 925, 745	98, 230	191, 506	1, 337	2, 216, 818
Illinois	90	0	55, 285	103, 699	159, 074
Indiana	800	800	17, 083	31, 224	49, 907
Kansas	17, 893, 683	484, 903	200, 506	89, 469	18, 668, 561
Kentucky	1, 005, 084	0	73, 740	36, 174	1, 114, 998
Louisiana[4]	59, 385, 482	8, 660, 291	3, 888, 993	0	71, 934, 766
Michigan	128, 620	84, 573	60, 160	377, 207	650, 560
Mississippi	2, 218, 544	232, 037	294, 300	5, 904	2, 750, 785
Montana	421, 417	24, 840	74, 658	82, 530	603, 445
Nebraska	75, 592	6, 973	18, 176	0	100, 741
New Mexico	10, 180, 234	2, 109, 562	1, 859, 492	40, 509	14, 189, 797
New York	40, 953	0	68	90, 888	131, 909
North Dakota	7, 375	153, 657	806, 934	0	967, 966
Ohio	271, 854	0	90, 618	369, 403	731, 875
Oklahoma	13, 872, 686	2, 142, 574	2, 214, 569	128, 909	18, 358, 738
Pennsylvania	707, 800	0	20, 578	453, 107	1, 181, 485
Texas[4]	79, 273, 608	26, 150, 990	14, 008, 260	70, 940	119, 503, 798
Utah	1, 268, 555	155, 687	371, 336	542	1, 796, 120
Virginia	33, 225	0	0	0	33, 225
West Virginia	1, 656, 459	0	60, 883	319, 711	2, 037, 053
Wyoming	3, 351, 786	147, 907	430, 506	22, 492	3, 952, 691
Other States[5]	42, 316	0	11, 804	110, 093	164, 213
Total	199, 772, 298	42, 555, 195	28, 933, 668	2, 504, 443	273, 765, 604

---

[1] Excludes gas loss due to natural gas liquids recovery.

[2] Net difference between gas stored in and gas withdrawn from underground storage reservoirs, including adjustments and native gas transferred from other reserves categories.

[3] Net production equals gross withdrawals less gas injected into producing reservoirs. Changes in underground storage and gas loss due to natural gas liquids recovery are excluded. Fourth quarter production estimated in some instances.

[4] Includes offshore reserves.

[5] Includes Alabama, Arizona, Florida, Iowa, Maryland, and Missouri.

[6] Free gas not in contact with crude oil in reservoirs and free gas in contact with oil, when production of such gas is not significantly affected by production of crude oil.

[7] Free gas in contact with crude oil in reservoir where production of such gas is significantly affected by production of crude oil.

[8] Gas in solution with crude oil in reservoirs.

[9] Gas held in underground reservoirs (including native and net-injected gas) for storage purposes.

Source: Committee on Natural Gas Reserves, American Gas Association.

TABLE 3.—Gross withdrawals and disposition of natural gas in the United States

(Million cubic feet)

State	Gross withdrawals [1]			Disposition		
	From gas wells	From oil wells	Total	Marketed production [2]	Repressuring	Vented and waste [3]
1961:						
Alaska	382	1,269	1,651	631	----------	1,020
Arkansas	45,800	42,100	87,900	59,547	25,748	2,605
California	214,000	653,000	867,000	556,241	298,209	12,550
Colorado	58,800	86,600	145,400	108,142	32,129	5,129
Illinois	2,000	14,200	16,200	9,970	----------	6,230
Indiana	300	3,400	3,700	382	----------	3,318
Kansas	639,900	57,500	697,400	649,083	617	47,700
Kentucky	68,900	3,500	72,400	70,937	----------	1,463
Louisiana	2,930,100	640,700	3,570,800	3,271,857	201,989	96,954
Maryland	3,578	----------	3,578	3,578	----------	----------
Michigan	20,000	12,200	32,200	27,697	4,023	480
Mississippi	136,800	99,500	236,300	172,543	54,180	9,577
Montana	28,700	8,300	37,000	33,901	302	2,797
Nebraska	8,600	8,300	16,900	15,743	101	1,056
New Mexico	515,600	290,700	806,300	789,662	7,025	9,613
New York	5,600	200	5,800	5,742	----------	58
North Dakota	1,000	26,300	27,300	20,100	2,187	5,013
Ohio	33,900	5,100	39,000	36,423	65	2,512
Oklahoma	667,600	492,000	1,159,600	892,697	97,613	169,290
Pennsylvania	100,200	3,300	103,500	100,427	42	3,031
Texas	5,353,000	1,667,100	7,020,100	5,963,605	930,984	125,511
Utah	17,500	52,500	70,000	57,175	10,233	2,592
Virginia	2,466	----------	2,466	2,466	----------	----------
West Virginia	207,400	3,300	210,700	210,556	80	64
Wyoming	132,800	94,000	226,800	194,674	17,227	14,899
Other States [4]	161	156	317	246	----------	71
Total	11,195,087	4,265,225	15,460,312	13,254,025	1,682,754	523,533
1962:						
Alaska	1,800	2,000	3,800	2,184	265	1,351
Arkansas	62,000	41,600	103,600	66,213	35,315	2,072
California	215,500	652,000	867,500	564,220	291,025	12,255
Colorado	58,200	80,800	139,000	101,826	33,194	3,980
Illinois	2,000	12,200	14,200	10,650	----------	3,550
Indiana	300	3,300	3,600	284	----------	3,316
Kansas	680,100	60,000	740,100	694,352	171	45,577
Kentucky	67,200	3,100	70,300	70,241	----------	59
Louisiana	3,124,000	730,000	3,854,000	3,525,456	221,167	107,377
Maryland	2,472	----------	2,472	2,472	----------	----------
Michigan	18,800	10,500	29,300	28,987	146	167
Mississippi	133,700	91,300	225,000	170,271	48,227	6,502
Montana	24,700	8,100	32,800	29,955	561	2,284
Nebraska	8,600	7,400	16,000	14,880	----------	1,120
New Mexico	523,200	293,600	816,800	804,612	7,780	4,408
New York	4,100	200	4,300	4,262	----------	38
North Dakota	1,000	30,500	31,500	25,155	2,974	3,371
Ohio	32,400	5,000	37,400	36,747	----------	653
Oklahoma	725,800	496,100	1,221,900	1,060,717	79,065	82,118
Pennsylvania	89,100	3,100	92,200	90,053	76	2,071
Texas	5,551,500	1,647,300	7,198,800	6,080,210	989,066	129,524
Utah	25,500	64,100	89,600	74,128	11,972	3,500
Virginia	2,499	----------	2,499	2,499	----------	----------
West Virginia	207,400	3,500	210,900	210,698	80	122
Wyoming	140,100	90,700	230,800	204,996	15,638	10,166
Other States [4]	411	191	602	554	----------	48
Total	11,702,382	4,336,591	16,038,973	13,876,622	1,736,722	425,629

---

[1] Marketed production plus quantities used in repressuring, vented, and wasted.

[2] Comprises gas sold or consumed by producers, including losses in transmission, quantities added to storage, and increases in gas in pipelines.

[3] Partly estimated: Includes direct waste on producing properties and residue blown to the air.

[4] Alabama, Arizona, Florida, Missouri, South Dakota, and Tennessee.

TABLE 4.—Marketed production of natural gas in the United States[1]

State	Quantity (million cubic feet)					Change from 1961 (percent)	Estimated value at wells (thousand dollars)	
	1958	1959	1960	1961	1962		1961	1962
Alabama	323	172	57	56	128	128.6	4	13
Alaska	50	133	246	631	2,184	246.1	129	467
Arizona	----------	----------	----------	----------	230	----------	----------	27
Arkansas	32,890	40,674	55,451	59,547	66,213	11.2	8,039	9,866
California	465,582	485,655	517,535	556,241	564,220	1.4	157,416	163,624
Colorado	82,464	99,899	107,404	108,142	101,826	−5.8	12,544	11,812
Florida	35	34	30	29	29	----------	5	6
Illinois	12,983	13,739	11,666	9,970	10,650	6.8	1,276	1,523
Indiana	378	484	342	382	284	−25.7	77	60
Kansas	561,816	604,410	634,410	649,083	694,352	7.0	81,135	86,100
Kentucky	72,248	73,504	75,329	70,937	70,241	−1.0	17,592	17,419
Louisiana	2,451,587	2,670,271	2,988,414	3,271,857	3,525,456	7.8	611,837	694,515
Maryland	4,266	4,373	4,065	3,578	2,472	−30.9	973	667
Michigan	14,243	18,916	20,790	27,697	28,987	4.7	5,844	6,174
Mississippi	160,143	162,095	172,478	172,543	170,271	−1.3	32,093	32,351
Missouri	----------	----------	75	90	92	2.2	22	23
Montana	27,989	30,743	33,418	33,901	29,955	−11.6	2,509	2,217
Nebraska	11,405	13,128	15,258	15,743	14,880	−5.5	2,629	2,708
New Mexico	761,446	739,660	798,928	789,662	804,612	1.9	86,073	92,530
New York	2,808	2,915	4,990	5,742	4,262	−25.8	1,694	1,198
North Dakota	17,325	17,915	19,483	20,100	25,155	25.1	2,533	3,446
Ohio	31,786	34,664	36,074	36,423	36,747	0.9	9,069	9,407
Oklahoma	696,504	811,508	824,266	892,697	1,060,717	18.8	108,016	135,772
Pennsylvania	95,869	99,366	113,928	100,427	90,053	−10.3	29,526	24,494
Tennessee	54	52	63	71	75	5.6	13	14
Texas	5,178,073	5,718,993	5,892,704	5,963,605	6,080,210	2.0	733,523	747,866
Utah	19,247	38,921	51,040	57,175	74,128	29.7	8,976	12,454
Virginia	2,521	2,280	2,227	2,466	2,499	1.3	668	677
West Virginia	204,581	204,633	208,757	210,556	210,698	0.1	57,692	57,942
Wyoming	121,682	156,978	181,610	194,674	204,996	5.3	24,334	29,929
Total	11,030,298	12,046,115	12,771,038	13,254,025	13,876,622	4.7	1,996,241	2,145,301

---

[1] Comprises gas either sold or consumed by producers, including losses in transmission, quantities added to storage and increases of gas in pipelines.

TABLE 5.—Natural gas stored underground in and withdrawn from storage fields

(Million cubic feet)

State	1961			1962		
	Total stored	Total withdrawn	Net stored	Total stored	Total withdrawn	Net stored
Arkansas	1,219	644	575	1,656	199	1,457
California	30,812	38,015	−7,203	64,025	32,459	31,566
Colorado	1,146	648	498	1,508	1,139	369
Delaware	------	------	------	226	206	20
Illinois	23,913	17,295	6,618	44,170	32,749	11,421
Indiana	10,203	8,356	1,847	14,132	7,362	6,770
Iowa	33.244	16,863	16,381	29.418	22,628	6,790
Kansas	43,000	33,651	9,349	44,152	34,847	9,305
Kentucky	17,218	13,578	3,640	18,016	19,311	−1,295
Michigan	131,234	110,457	20,777	157,721	154,349	3,372
Mississippi	4,290	4,051	239	3,282	2,590	692
Missouri	7,471	3,108	4,363	8,891	4,571	4,320
Montana	7,281	3,424	3,857	14,444	4,672	9,772
Nebraska	------	------	------	398	182	216
New Mexico	4,861	5.919	−1,058	5,073	6,003	−930
New York	35,574	37,276	−1,702	39,437	39,670	−233
Ohio	116,565	96,434	20,131	125,023	128,530	−3,507
Oklahoma	23,779	18,254	5,525	29,299	17,784	11,515
Pennsylvania	183,563	157,667	25,896	178,370	183,172	−4,802
Texas	24,044	15,540	8,504	22,409	18,244	4,165
Utah	918	459	459	733	694	39
Virginia	------	------	------	------	7	−7
West Virginia	141,095	113,742	27,353	135,159	140.477	−5,318
Wyoming	2,236	2,669	−433	3,281	2,491	790
Total	843,666	698,050	145,616	940,823	854,336	86,487

TABLE 6.—Underground storage statistics, December 31, 1962

State	Number of pools	Number of active wells	Total gas in storage reservoirs (million cubic feet)	Total reservoir capacity (million cubic feet)
Arkansas	2	17	5,588	5,842
California	6	141	164,717	282,806
Colorado	1	16	1,337	1,437
Illinois	8	403	103,699	242,529
Indiana	17	437	31,224	34,399
Iowa	3	120	89,805	186,898
Kansas	16	739	89,469	102,450
Kentucky	11	491	36,174	36,701
Michigan	22	1,463	377,207	462,655
Mississippi	2	23	5,904	6,127
Missouri	2	55	20,288	69,524
Montana	5	157	82,531	155,849
New Mexico	4	48	40,509	77,871
New York	15	701	90,887	107,070
Ohio	18	2,352	369,403	449,581
Oklahoma	9	90	128,909	254,171
Pennsylvania	66	1,985	453,107	528,667
Texas	11	109	70,940	91,295
Utah	1	9	543	646
West Virginia	37	1,156	319,711	344,944
Wyoming	2	9	22,492	62,972
Total	258	10,521	2,504,444	3,504,434

Source: American Gas Association.

TABLE 7.—Gas wells and condensate wells in the United States

State	Drilled during 1961 [1]	Producing Dec. 31, 1961	Drilled during 1962 [1]	Producing Dec. 31, 1962
Alabama	-----	-----	-----	-----
Alaska	5	5	5	8
Arizona	1	-----	9	3
Arkansas	43	485	48	480
California	157	774	163	826
Colorado	116	462	89	451
Illinois	13	74	11	30
Indiana	6	300	7	290
Kansas	326	6, 633	232	6, 915
Kentucky	238	5, 119	223	5, 200
Louisiana	632	6, 990	724	7, 442
Maryland	-----	34	-----	33
Michigan	68	155	71	174
Mississippi	42	472	26	490
Missouri	-----	9	-----	6
Montana	4	981	19	954
Nebraska	2	49	5	47
New Mexico	440	6, 491	421	6, 967
New York	16	1, 109	43	1, 130
North Dakota	-----	28	-----	29
Ohio	194	7, 077	261	7, 117
Oklahoma	593	6, 218	572	6, 324
Pennsylvania	212	16, 500	271	16, 600
Tennessee	8	23	3	30
Texas	1, 551	19, 831	1, 546	20, 834
Utah	38	135	53	121
Virginia	2	98	10	98
West Virginia	857	16, 297	952	17, 121
Wyoming	100	460	84	547
Total	5, 664	96, 809	5, 848	100, 267

[1] Source, Oil and Gas Journal.

INTERSTATE SHIPMENTS, IMPORTS AND EXPORTS

Interstate shipments of natural gas, including imports and exports, were 8,418 billion cubic feet, an increase of 6 percent over the 7,949 billion cubic feet shipped in 1961. The west south central region, where 77 percent of the reserves are located, furnished 73 percent of these shipments. Interstate movements excluding imports were 8,017 billion cubic feet—58 percent of the marketed production.

Total imports of natural gas for the year were 401,534 million cubic feet, 83 percent more than in 1961. Natural gas imported from Canada totaled 350,438 million cubic feet in 1962 compared to 167,104 million in 1961. Canadian gas entered the United States at points in Idaho, Minnesota, Montana, and Washington and was consumed in the following regions: Pacific, mountain, east north central and west north central. Natural gas imports from Mexico amounted to 51,096 million cubic feet, about the same as 1961. Exports to Canada were 5,574 million cubic feet, and shipments to Mexico were 10,240 million cubic feet.

TABLE 8.—Marketed production, interstate shipments, and total consumption of natural gas in the United States,[1] in 1962, in million cubic feet

State by region or country	Marketed production		Interstate movements		Transmission loss and unaccounted for	Change in underground storage	Consumption
	Quantity	Average value at wellhead (cents per Mcf)	Quantity shipped	Quantity received			
New England:							
Connecticut	----------	----------	----------	33,898	1,671	----------	32,227
Massachusetts	----------	----------	----------	91,318	2,303	----------	89,015
New Hampshire	----------	----------	----------	3,488	173	----------	3,315
Rhode Island	----------	----------	----------	14,383	589	----------	13,794
Total: 1962	----------	----------	----------	143,087	4,736	----------	138,351
1961	----------	----------	----------	133,156	5,229	----------	127,927
Middle Atlantic:							
New Jersey	----------	----------	----------	185,334	11,124	----------	174,210
New York	4,262	28.1	2,314	485,709	13,506	−233	474,384
Pennsylvania	90,053	27.2	87,864	562,333	19,244	−4,802	550,080
Total: 1962	94,315	27.2	90,178	1,233,376	43,874	−5,035	1,198,674
1961	106,169	29.4	76,049	1,154,153	41,140	24,194	1,118,939
East North Central:							
Illinois	10,650	14.3	603	635,562	13,879	11,421	620,309
Indiana	284	21.1	149	286,534	7,590	6,770	272,309
Michigan	28,987	21.3	----------	429,472	11,410	3,372	443,677
Ohio	36,747	25.6	1,078	729,362	12,140	−3,507	756,398
Wisconsin	----------	----------	----------	141,693	5,177	----------	136,516
Total: 1962	76,668	22.4	1,830	2,222,623	50,196	18,056	2,229,209
1961	74,472	21.8	4,042	2,058,802	24,496	49,373	2,055,363
West North Central:							
Iowa	----------	----------	----------	221,462	1,120	6,790	213,552
Kansas	694,352	12.4	582,155	285,180	8,017	9,305	380,055
Minnesota	----------	----------	----------	211,955	−2,175	----------	214,130
Missouri	92	25.0	5	301,581	7,866	4,320	289,482
Nebraska	14,880	18.2	----------	131,579	200	216	146,043
North Dakota	25,155	13.7	6,012	3,279	226	----------	22,196
South Dakota	----------	----------	----------	27,327	−86	----------	27,413
Total: 1962	734,479	12.6	588,172	1,182,363	15,168	20,631	1,292,871
1961	685,016	12.6	535,521	1,127,209	21,306	30,093	1,225,305
South Atlantic:							
Delaware	----------	----------	----------	14,957	445	20	14,492
District of Columbia	----------	----------	----------	20,306	968	----------	19,338
Florida	29	20.7	----------	161,095	3,389	----------	157,735
Georgia	----------	----------	----------	194,572	1,934	----------	192,638
Maryland	2,472	27.0	766	77,548	2,703	----------	76,551
North Carolina	----------	----------	----------	58,723	2,350	----------	56,373
South Carolina	----------	----------	----------	73,954	3,309	----------	70,645
Virginia	2,499	21.1	1,802	80,656	4,106	−7	77,254
West Virginia	210,698	27.5	203,590	175,578	−598	−5,318	188,602
Total: 1962	215,698	27.5	206,158	857,389	18,606	−5,305	853,628
1961	216,629	27.4	198,244	818,481	15,361	27,353	794,152
East South Central:							
Alabama	128	9.8	9	195,426	1,176	----------	194,369
Kentucky	70,241	24.8	56,532	157,531	4,397	−1,295	168,138
Mississippi	170,271	19.0	140,731	174,753	3,868	692	199,733
Tennessee	75	18.5	----------	168,961	1,299	----------	167,737
Total: 1962	240,715	20.7	197,272	696,671	10,740	−603	729,977
1961	243,607	20.4	203,650	671,156	8,816	3,879	698,418
West South Central:							
Arkansas	66,213	14.9	3,835	179,056	15,233	1,457	224,744
Louisiana	3,525,456	19.7	2,658,935	153,720	13,200	----------	1,007,041
Oklahoma	1,060,717	12.8	567,974	22,059	17,561	11,515	485,726
Texas	6,080,210	12.3	2,909,624	79,661	36,114	4,165	3,209,968
Total: 1962	10,732,596	14.8	6,140,368	434,496	82,108	17,137	4,927,479
1961	10,187,706	14.3	5,847,440	393,610	63,955	14,604	4,655,317

TABLE 8.—Marketed production, interstate shipments, and total consumption of natural gas in the United States,[1] in 1962, in million cubic feet—Continued

State by region or country	Marketed production		Interstate movements		Transmission loss and unaccounted for	Change in underground storage	Consumption
	Quantity	Average value at wellhead (cents per Mcf)	Quantity shipped	Quantity received			
Mountain:							
Arizona	230	11.9	198	159,626	1,766	----	157,892
Colorado	101,826	11.6	45,613	150,493	1,397	369	204,940
Idaho	----	----	----	25,223	−583	----	25,806
Montana	29,955	7.4	4,308	48,915	1,492	9,772	63,298
Nevada	----	----	----	17,558	30	----	17,528
New Mexico	804,612	11.5	562,868	59,976	10,155	−930	292,495
Utah	74,128	16.8	36, 69	61,112	6,242	39	92,890
Wyoming	204,996	14.6	143,702	5,820	−1,012	790	67,336
Total: 1962	1,215,747	12.3	792,758	528,723	19,487	10,040	922,185
1961	1,183,554	11.4	865,304	595,171	14,414	3,323	895,684
Pacific:							
Alaska	2,184	21.4	----	----	47	----	2,137
California	564,220	29.0	----	984,253	40,585	31,566	1,476,322
Oregon	----	----	----	37,547	−318	----	37,865
Washington	----	----	----	81,928	497	----	81,431
Total: 1962	566,404	29.0	----	1,103,728	40,811	31,566	1,597,755
1961	556,872	28.3	----	986,625	40,091	−7,203	1,510,609
Total United States:							
1962	13,876,622	15.5	8,016,736	8,402,456	285,726	86,487	13,890,129
1961	13,254,025	15.1	7,730,250	7,938,363	234,808	145,616	13,081,714
Foreign:							
Canada	----	----	350,438	5,574	----	----	----
Mexico	----	----	51,096	10,240	----	----	----
Total movements:							
1962	----	----	8,418,270	8,418,270	----	----	----
1961	----	----	7,949,110	7,949,110	----	----	----

---

[1] No shipments were made into Maine, Vermont, and Hawaii.

TABLE 9.—Natural gas moving interstate, imports, and exports, 1962, in million cubic feet

State by region or country	Quantity received	Producing region								
		Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Canada	Mexico
New England:										
Connecticut	33,898	1,345	----	----	12	843	30,761	----	----	937
Massachusetts	91,318	3,273	37	----	28	2,050	83.649	----	----	2,281
New Hampshire	3,488	----	----	----	----	1	3,487	----	----	----
Rhode Island	14,383	762	33	----	7	478	12,572	----	----	531
Total	143,087	5,380	70	----	47	3,372	130,469	----	----	3,749
Middle Atlantic:										
New Jersey	185,334	4,623	----	----	165	2,905	174,459	----	----	3,182
New York	485,709	62,340	----	----	9,829	4,512	404,740	----	----	4,288
Pennsylvania	562,333	3,914	38	1	53,352	17,239	474,029	----	----	13,760
Total	1,233,376	70,877	38	1	63,346	24,656	1,053,228	----	----	21,230
East North Central:										
Illinois	635,562	----	149	58,597	----	185	574,865	996	294	476
Indiana	286,534	----	11	41,276	----	1,681	242,872	4	----	690
Michigan	429,472	----	----	51,542	----	548	376,979	113	164	126
Ohio	729,362	12,933	905	4	93,526	33,148	577,082	----	----	11,764
Wisconsin	141,693	----	----	15,407	----	----	67,207	920	58,159	----
Total	2,222,623	12,933	1,065	166,826	93,526	35,562	1,839,005	2,033	58,617	13,056

TABLE 9.—Natural gas moving interstate, imports, and exports, 1962, in million cubic feet—Continued

State by region or country	Quantity received	Producing region								
		Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Canada	Mexico
West North Central:										
Iowa	221, 462	------	------	79, 226	------	------	136, 580	5, 656	------	------
Kansas	285, 180	------	------	409	------	------	277, 165	7, 606	------	------
Minnesota	211, 955	------	------	100, 961	------	------	101. 487	7, 406	2, 101	------
Missouri	301, 581	------	------	94, 552	------	104	206, 014	87	------	824
Nebraska	131, 579	------	------	68, 643	------	------	48, 686	14, 250	------	------
North Dakota	3, 279	------	------	370	------	------	------	1, 673	1, 236	------
South Dakota	27, 327	------	------	10, 688	------	------	8, 706	7, 933	------	------
Total	1, 182, 363	------	------	354, 849	------	104	778, 638	44, 611	3, 337	824
South Atlantic:										
Delaware	14, 957	------	------	------	1	2	14, 954	------	------	------
District of Columbia	20, 306	18	37	------	5, 609	1, 283	13, 355	------	------	4
Florida	161, 095	------	------	------	------	10, 745	150, 334	------	------	16
Georgia	194, 572	------	------	------	------	45, 299	149, 273	------	------	------
Maryland	77, 548	218	132	------	19, 379	4, 678	53, 096	------	------	45
North Carolina	58, 723	------	------	------	------	10	58, 713	------	------	------
South Carolina	73, 954	------	------	------	------	13, 041	60, 913	------	------	------
Virginia	80, 656	------	129	------	19, 233	4, 606	56, 688	------	------	------
West Virginia	175, 578	741	347	------	3, 837	10, 967	159, 538	------	------	148
Total	857, 389	977	645	------	48, 059	90, 631	716, 864	------	------	213
East South Central:										
Alabama	195, 426	------	------	------	------	40, 780	154, 545	------	------	101
Kentucky	157, 531	11	12	------	1, 180	1, 066	154, 276	------	------	986
Mississippi	174, 753	------	------	------	------	213	173, 839	------	------	701
Tennessee	168, 961	------	------	------	------	255	167, 758	------	------	948
Total	696, 671	11	12	------	1, 180	42, 314	650, 418	------	------	2, 736
West South Central:										
Arkansas	179, 056	------	------	------	------	24	178, 730	------	------	302
Louisiana	153, 720	------	------	------	------	575	149, 522	------	------	3, 623
Oklahoma	22, 059	------	------	3, 067	------	------	18, 469	523	------	------
Texas	79, 661	------	------	105	------	34	65, 111	9, 048	------	5, 363
Total	434, 496	------	------	3, 172	------	633	411, 832	9, 571	------	9, 288
Mountain:										
Arizona	159, 626	------	------	1	------	------	69, 057	90, 568	------	------
Colorado	150, 493	------	------	57, 460	------	------	40, 880	52, 153	------	------
Idaho	25, 223	------	------	------	------	------	------	9, 048	16, 175	------
Montana	48, 915	------	------	4, 072	------	------	------	17, 098	27, 745	------
Nevada	17, 558	------	------	------	------	------	6. 597	10, 961	------	------
New Mexico	59, 976	------	------	1	------	------	51, 878	8, 097	------	------
Utah	61, 112	------	------	------	------	------	------	61, 112	------	------
Wyoming	5, 820	------	------	1, 709	------	------	1, 250	2, 861	------	------
Total	528, 723	------	------	63, 243	------	------	169, 662	251, 898	43, 920	------
Pacific:										
California	984, 253	------	------	81	------	------	376, 388	482, 695	125, 089	------
Oregon	37, 547	------	------	------	------	------	------	------	37, 547	------
Washington	81, 928	------	------	------	------	------	------	------	81, 928	------
Total	1, 103, 728	------	------	81	------	------	376, 388	482, 695	244, 564	------
Total United States	8, 402, 456	90, 178	1, 830	588, 172	206, 158	197, 272	6, 126, 504	790, 808	350, 438	51, 096
Foreign:										
Canada	5, 574	------	------	------	------	------	5, 500	74	------	------
Mexico	10, 240	------	------	------	------	------	8, 364	1, 876	------	------
Total exports	15, 814	------	------	------	------	------	13, 864	1, 950	------	------
Total	8, 418, 270	90, 178	1, 830	588, 172	206, 158	197, 272	6, 140, 368	792, 758	350, 438	51, 096

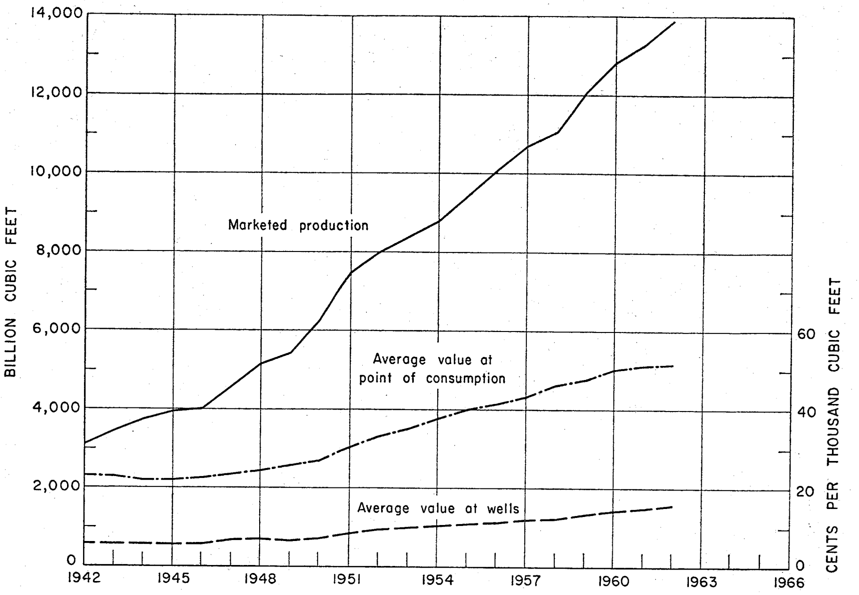


Figure 1.—Production and average value of natural gas in the United States, 1942–62.

PIPELINES

At the end of 1962 there were 687,300 miles of natural gas pipeline in service. This represents an increase of 113,270 miles of pipeline in the last 3 years. Of this total 200,200 miles are classified as transmission lines, 427,600 as distribution lines, and the remaining 59,500 miles as field and gathering lines.

The total cost of construction authorized by the Federal Power Commission in 1962 was $627,844,000. The authorized construction included the installation of compressors aggregating 425,250 horsepower. The additional 4,899 miles of pipelines authorized require an estimated 1,033,492 net tons of steel pipe. It is estimated about 70 percent of the total was completed and placed in operation during 1962.

CONSUMPTION

The tables shown in this chapter pertaining to natural gas consumption are arranged by Bureau of the Census regions to reflect more easily the marketing condition by areas. Natural gas was consumed in 47 States and the District of Columbia; none was consumed in Maine, Vermont, or Hawaii. Due to the severe cold weather in the eastern part of the United States, gross withdrawals exceeded the gross injections in the following areas: Middle Atlantic, −5,035 million cubic feet; South Atlantic, −5,305 million cubic feet; and East South Central, −603 million cubic feet. Total consumption was 13,890 billion cubic feet, an increase of 6 percent over 1961. Consumption by class of consumer and percentage change from 1961 were as follows: Residential, 3,479 billion cubic feet (+7 percent); commercial, 1,207 billion cubic feet (+12 percent); industrial, excluding field and carbon black, 7,078 billion cubic feet (+5 percent); field use, which includes extraction loss and plant fuel at natural gas processing plants, 1,993 billion cubic feet (+6 percent); and carbon black, 133 billion cubic feet (−17 percent). The portland cement industry consumed 188 billion cubic feet in 1962, compared to 180 billion last year.

Residential consumers totaled 32,655 thousand in 1962, an increase of 603 thousand for the year.

Natural gas in 1962 supplied 30 percent of the total United States energy from fuels and waterpower.

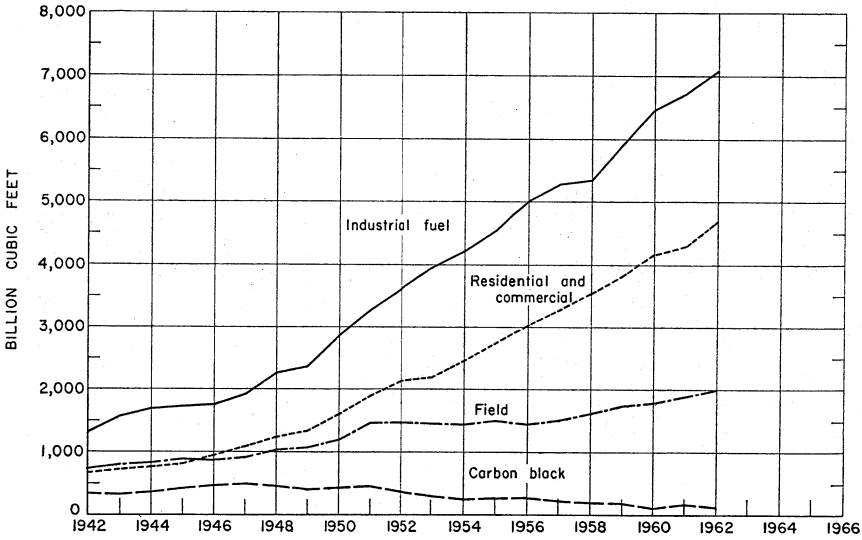


FIGURE 2.—Consumption of natural gas, by uses, in the United States, 1942–62.

TABLE 10.—Consumption of natural gas in the United States[1]

State by region	Quantity (million cubic feet)					Change from 1961 (percent)	Estimated value at points of consumption	
	1958	1959	1960	1961	1962		1961	1962
New England:								
Connecticut	27, 884	25, 875	28, 453	30, 361	32, 227	6. 1	51, 080	53, 864
Massachusetts	67, 602	72, 994	77, 886	81, 768	89, 015	8. 9	141, 664	150, 948
New Hampshire	2, 421	2, 480	2, 852	3, 018	3, 315	9. 8	4, 821	5, 582
Rhode Island	9, 940	11, 011	11, 839	12, 780	13, 794	7. 9	20, 824	22, 228
Total	107, 847	112, 360	121, 030	127, 927	138, 351	8. 1	218, 389	232, 622
Middle Atlantic:								
New Jersey	119, 946	132, 984	139, 258	153, 806	174, 210	13. 3	228, 946	249, 726
New York	343, 326	379, 928	419, 460	435, 417	474, 384	8. 9	580, 936	547, 904
Pennsylvania	465, 732	502, 066	520, 788	529, 716	550, 080	3. 8	436, 203	452, 810
Total	929, 004	1, 014, 978	1, 079, 506	1, 118, 939	1, 198, 674	7. 1	1, 246, 085	1, 250, 440
East North Central:								
Illinois	452, 006	518, 111	536, 549	574, 346	620, 309	8. 0	419, 578	489, 550
Indiana	154, 583	171, 158	212, 851	239, 932	272, 309	13. 5	151, 592	175, 926
Michigan	298, 104	332, 756	368, 531	407, 732	443, 677	8. 8	335, 571	365, 979
Ohio	618, 022	670, 618	698, 569	719, 674	756, 398	5. 1	506, 304	535, 155
Wisconsin	67, 596	82, 377	90, 620	113, 679	136, 516	20. 1	108, 292	124, 976
Total	1, 590, 311	1, 775, 020	1, 907, 120	2, 055, 363	2, 229, 209	8. 5	1, 521, 337	1. 691, 586
West North Central:								
Iowa	159, 982	182, 827	187, 138	204, 663	213, 552	4. 3	112, 993	121, 576
Kansas	362, 280	380, 241	372, 302	364, 957	380, 055	4. 1	115, 179	117, 864
Minnesota	149, 042	161, 390	179, 827	192, 584	214, 130	11. 2	128, 850	135, 955
Missouri	241, 239	255, 095	261, 372	274, 487	289, 482	5. 5	152, 866	160, 690
Nebraska	114, 661	132, 651	139, 028	143, 169	146, 043	2. 0	68, 407	71, 061
North Dakota	15, 639	16, 981	17, 274	19, 625	22, 196	13. 1	7, 255	8, 501
South Dakota	19, 535	23, 584	24, 533	25, 820	27, 413	6. 2	15, 129	16, 242
Total	1, 062, 378	1, 152, 769	1, 181, 474	1, 225, 305	1, 292, 871	5. 5	600, 679	631, 889
South Atlantic:								
Delaware	8, 301	9, 459	9, 035	9, 380	14, 492	54. 5	10, 549	11, 978
District of Columbia	17, 594	17, 123	18, 142	18, 518	19, 338	4. 4	28, 050	28, 691
Florida	44, 174	91, 490	137, 875	143, 656	157, 735	9. 8	75, 151	82, 587
Georgia	164, 114	180, 342	182, 087	179, 957	192, 638	7. 0	109, 034	116, 375
Maryland	57, 328	60, 674	64, 923	68, 390	76, 551	11. 9	92, 817	100, 298
North Carolina	23, 519	32, 685	45, 442	50, 523	56, 373	11. 6	37, 329	42, 712
South Carolina	39, 678	54, 363	58, 532	60, 928	70, 645	15. 9	36, 629	43, 082
Virginia	56, 052	59, 842	66, 181	70, 579	77, 254	9. 5	73, 276	79, 311
West Virginia	164, 347	191, 548	179, 969	192, 221	188, 602	—1. 9	102, 622	101, 067
Total	575, 107	697, 526	762, 186	794, 152	853, 628	7. 5	565, 457	606, 101
East South Central:								
Alabama	172, 406	178, 595	184, 118	184, 909	194, 369	5. 1	100, 263	102, 247
Kentucky	136, 990	147, 993	159, 710	161, 912	168, 138	3. 8	90, 948	94, 807
Mississippi	157, 169	183, 158	188, 864	190, 930	199, 733	4. 6	68, 319	71, 702
Tennessee	142, 860	149, 462	155, 623	160, 667	167, 737	4. 4	71, 730	81, 224
Total	609, 425	659, 208	688, 315	698, 418	729, 977	4. 5	331, 260	349, 980
West South Central:								
Arkansas	202, 361	218, 528	216, 516	209, 420	224, 744	7. 3	66, 807	73, 709
Louisiana	931, 203	893, 369	947, 938	1, 036, 887	1, 007, 041	—2. 9	237, 206	244, 660
Oklahoma	342, 080	379, 178	383, 042	378, 096	485, 726	28. 5	102, 899	129, 834
Texas	2, 555, 541	2, 865, 595	2, 981, 167	3, 030, 914	3, 209, 968	6. 0	594, 251	661, 296
Total	4, 031, 185	4, 356, 670	4, 528 663	4, 655, 317	4, 927, 479	5. 9	1, 001, 163	1, 109, 499

TABLE 10.—Consumption of natural gas in the United States[1]—Continued

State by region	Quantity (million cubic feet)					Change from 1961 (percent)	Estimated value at points of consumption	
	1958	1959	1960	1961	1962		1961	1962
Mountain:								
Arizona	105,034	112,722	135,494	153,674	157,892	2.7	73,246	71,203
Colorado	165,099	196,057	207,646	212,611	204,940	−3.6	83,120	81,665
Idaho	15,903	19,641	22,006	23,969	25,806	7.7	13,364	15,074
Montana	51,825	52,183	54,569	57,781	63,298	9.5	23,278	26,524
Nevada	8,826	10,450	12,447	15,864	17,528	10.5	11,108	12,172
New Mexico	251,518	272,922	266,409	288,455	292,495	1.4	57,490	61,382
Utah	55,706	61,401	75,650	81,879	92,890	13.4	36,698	42,437
Wyoming	46,810	59,119	59,635	61,451	67,336	9.6	15,570	15,821
Total	700,721	784,495	838,856	895,684	922,185	3.0	313,874	326,278
Pacific:								
Alaska	----------	133	229	557	2,137	283.7	189	1,640
California	1,078,855	1,180,331	1,311,253	1,405,882	1,476,322	5.0	803,404	868,855
Oregon	22,752	27,498	30,861	33,827	37,865	11.9	25,097	28,165
Washington	53,063	58,650	64,934	70,343	81,431	15.8	40,472	47,635
Total	1,154,670	1,266,612	1,407,277	1,510,609	1,597,755	5.8	869,162	946,295
Total United States	10,760,648	11,819,638	12,509,427	13,081,714	13,890,129	6.2	6,667,406	7,144,690

[1] Includes volume of natural gas which is distributed as a component of mixed gas.

TABLE 11.—Number of consumers and volume of natural gas consumed by principal uses in United States, in 1962 [1]

State by region	Number of consumers (in thousands)		Volume of natural gas, million cubic feet									
					Industrial							
	Residential	Commercial	Residential	Commercial	Field (pumping, drilling extraction loss, plant fuel)	Carbon black	Petroleum refineries	Used as pipeline fuel	All other fuel including electric utilities	Total Industrial	Total Consumption	Consumed at electric utilities (included in other industrial fuel) [2]
New England:												
Connecticut	351	24	18, 697	3, 994	----------	----------	----------	108	9, 428	9, 536	32, 227	503
Massachusetts	1, 017	59	54, 081	14, 305	----------	----------	----------	184	20, 445	20, 629	89, 015	8, 564
New Hampshire	30	2	2, 150	635	----------	----------	----------	----------	530	530	3, 315	----------
Rhode Island	145	7	7, 863	2, 245	----------	----------	----------	102	3, 584	3, 686	13, 794	337
Total	1, 543	92	82, 791	21, 179	----------	----------	----------	394	33, 987	34, 381	138, 351	9, 404
Middle Atlantic:												
New Jersey	1, 463	103	96, 363	13, 725	----------	----------	----------	277	63, 845	64, 122	174, 210	27, 576
New York	3, 687	306	254, 597	74, 158	551	----------	----------	2, 681	142, 397	145, 629	474, 384	68, 882
Pennsylvania	2, 039	127	245, 017	61, 825	3, 296	----------	27, 617	15, 151	197, 174	243, 238	550, 080	1, 934
Total	7, 189	536	595, 977	149, 708	3, 847	----------	27, 617	18, 109	403, 416	452, 989	1, 198, 674	98, 392
East North Central:												
Illinois	2, 309	143	276, 634	68, 404	17, 897	----------	13, 543	9, 459	234, 372	275, 271	620, 309	41, 856
Indiana	784	69	95, 043	27, 751	57	----------	8, 152	6, 895	134, 411	149, 515	272, 309	13, 309
Michigan	1, 507	124	234, 483	64, 495	3, 381	----------	1, 902	1, 849	137, 567	144, 699	443, 677	2, 583
Ohio	2, 155	173	390, 412	124, 381	1, 492	----------	8, 749	9, 481	221, 883	241, 605	756, 398	2, 431
Wisconsin	559	38	58, 797	17, 352	----------	----------	1, 201	392	58, 774	60, 367	136, 516	12, 322
Total	7, 314	547	1, 055, 369	302, 383	22, 827	----------	33, 547	28, 076	787, 007	871, 457	2, 229, 209	72, 501
West North Central:												
Iowa	445	51	67, 729	33, 035	----------	----------	----------	8, 913	103, 875	112, 788	213, 552	55, 304
Kansas	525	49	85, 414	27, 337	[4] 30, 322	(4)	28, 728	34, 941	173, 313	267, 304	380, 055	95, 146
Minnesota	489	36	71, 892	38, 192	----------	----------	(3)	725	[3] 103, 321	104, 046	214, 130	48. 132
Missouri	804	67	119, 349	39, 025	----------	----------	(3)	7, 863	[3] 123, 245	131, 108	289, 482	34, 872
Nebraska	273	35	43, 158	21, 658	4, 371	----------	(3)	6, 585	[3] 70, 271	81, 227	146, 043	32, 313
North Dakota	37	5	4, 699	4, 032	11, 805	----------	(3)	35	[3] 1, 625	13, 465	22, 196	276
South Dakota	62	8	8, 556	7, 750	----------	----------	----------	44	11, 063	11, 107	27, 413	5, 801
Total	2, 635	251	400, 797	171, 029	[4] 46, 498	(4)	[3] 32, 919	59, 106	582, 522	721, 045	1, 292, 871	271, 844
South Atlantic:												
Delaware	64	4	4, 634	879	----------	----------	(3)	----------	[3] 8, 979	8, 979	14, 492	3, 580
District of Columbia	(5)	(5)	(5)	(5)	----------	----------	----------	----------	(5)	(5)	(5)	----------
Florida	284	20	6, 589	10, 457	645	----------	----------	1, 711	138, 333	140, 689	157, 735	89, 019

Georgia	570	47	58,784	25,208	----------	----------	(3)	3,947	[3] 104,699	108,646	192,638	16,288
Maryland	[5]707	[5]56	[5]60,663	[5]13,984	32	----------	----------	1,167	[5] 20,043	[5] 21,242	[5] 95,889	68
North Carolina	144	19	11,514	4,913	----------	----------	----------	3,458	36,488	39,946	56,373	2,537
South Carolina	147	18	9,167	6,221	----------	----------	----------	1,621	53,636	55,257	70,645	21,414
Virginia	361	31	31,242	13,056	71	----------	----------	5,341	27,544	32,956	77,254	1,592
West Virginia	322	31	49,638	16,750	37,244	----------	651	7,796	76,523	122,214	188,602	759
Total	2,599	226	232,231	91,468	37,992	----------	[3]1,674	25,041	465,222	529,929	853,628	135,257
East South Central:												
Alabama	547	42	42,183	29,099	117	----------	(3)	8,462	[3] 114,508	123,087	194,369	6,233
Kentucky	411	41	61,956	24,396	12,043	----------	(3)	20,434	[3] 49,309	81,786	168,138	1,654
Mississippi	266	35	23,847	18.593	17,384	----------	(3)	32,395	[3] 107,514	157,293	199,733	37,552
Tennessee	369	41	35,521	37,987	78	----------	(3)	16,092	[3] 78,059	94,229	167,737	7,844
Total	1,593	159	163,507	110,075	29,622	----------	[3] 7,953	77,383	341,437	456,395	729,977	53,283
West South Central:												
Arkansas	292	43	33,718	20,113	9,556	----------	12,182	9,366	139,809	170,913	224,744	52,360
Louisiana	694	56	58,089	19,895	227,512	17,992	106,751	33,561	543,241	929,057	1,007,041	135,162
Oklahoma	570	59	62,968	23,898	161,630	----------	48,599	8,017	180,614	398,860	485,726	98,353
Texas	2,196	216	196,433	67,868	1,124,754	84,574	427,359	61,208	1,247,772	2,945,667	3,209,968	491,184
Total	3,752	374	351,208	131,774	1,523,452	102,566	594,891	112,152	2,111,436	4,444,497	4,927,479	777,059
Mountain:												
Arizona	318	31	22,158	12,512	----------	----------	----------	15,022	108,200	123,222	157,892	60,637
Colorado	383	52	57,174	31,919	12,676	----------	2,666	1,383	99,122	115,847	204,940	32,437
Idaho	32	7	3,185	4,371	----------	----------	----------	233	18,017	18,250	25,806	----------
Montana	113	14	17,172	12,370	6,919	----------	2,510	1,293	23,034	33,756	63,298	3,712
Nevada	17	1	1,479	787	----------	----------	----------	----------	15,262	15,262	17,528	10,288
New Mexico	156	20	23,522	12,773	109,925	26,960	1,481	25,413	92,421	256,200	292,495	37,662
Utah	183	22	28,049	11,853	10,268	----------	4,651	157	37,912	52,988	92,890	5,251
Wyoming	63	9	10,011	6,622	27,088	----------	10,606	2,354	10,655	50,703	67,336	703
Total	1,265	156	162,750	93,207	166,876	26,960	21,914	45,855	404,623	666,228	922,185	150,690
Pacific:												
Alaska	(6)	(6)	537	18	212	----------	----------	72	1,298	1,582	2,137	n.a.
California	4,547	335	415,484	124,321	[4] 165,578	(4)	69,362	15,796	685,781	936,517	1,476,322	396,660
Oregon	100	14	7,977	3,562	----------	----------	----------	65	26,261	26,326	37,865	500
Washington	118	22	9,935	7,944	----------	----------	----------	447	63,105	63,552	81,431	----------
Total	4,765	371	433,933	135,845	[4] 165,790	----------	69,362	16,380	776,445	1,027,977	1,597,755	397,160
Total United States:												
1962	32,655	2,712	3,478,563	1,206,668	[4] 1,993,128	[4] 133,302	[3]789,877	382,496	5,906 095	9,204,898	13,890,129	1,965,590
1961	32,052	2,641	3,248,578	1,076,849	1,881,208	161,377	772,028	377,607	5,564,067	8,756,287	13,081,714	1,825,341

---

[1] Includes natural gas which is distributed as component of mixed gas.

[2] Source: Federal Power Commission. Preliminary.

[3] 13,167 million cubic feet included in "Other industrial fuel" to avoid disclosure; included in "Refinery fuel" region totals.

[4] 3,776 million cubic feet included in "Field" to avoid disclosure included in United States total.

[5] Included with Maryland to avoid disclosure.

[6] Less than 1,000 consumers.

n.a.—not available.

TABLE 12.—Value of natural gas at the point of consumption in the United States in 1962

State by region	Value (thousand dollars)							Average value (cent per MCF)						
			Industrial							Industrial				
	Residential	Commercial	Field (pumping, drilling, extraction loss and plant fuel)	Carbon black	All other including electric utilities	Total industrial	Total consumption	Residential	Commerical	Field	Carbon black	All other	Total	Total consumption
New England:														
Connecticut	36,852	7,242	--------	--------	9,770	9,770	53,864	197.1	181.3	--------	--------	102.5	102.5	167.1
Massachusetts	112,359	22,690	--------	--------	15,899	15,899	150,948	207.8	158.6	--------	--------	77.1	77.1	169.6
New Hampshire	4,008	1,094	--------	--------	480	480	5,582	186.4	172.3	--------	--------	90.5	90.5	168.4
Rhode Island	15,938	3,244	--------	--------	3,046	3,046	22,228	202.7	144.5	--------	--------	82.6	82.6	161.1
Total	169,157	34,270	--------	--------	29,195	29,195	232,622	204.3	161.8	--------	--------	84.9	84.9	168.1
Middle Atlantic:														
New Jersey	189,839	23,908	--------	--------	35,979	35,979	249,726	197.0	174.2	--------	--------	56.1	56.1	143.3
New York	349,957	102,435	294	--------	95,218	95,512	547,904	137.5	138.1	53.4	--------	65.6	65.6	115.5
Pennsylvania	270,924	53,767	1,185	--------	126,934	128,119	452,810	110.6	87.0	36.0	--------	52.9	52.7	82.3
Total	810,720	180,110	1,479	--------	258,131	259,610	1,250,440	136.0	120.3	38.4	--------	57.4	57.3	104.3
East North Central:														
Illinois	318,970	58,719	2,355	--------	109,506	111,861	489,550	115.3	85.8	13.2	--------	42.5	40.6	78.9
Indiana	94,003	24,405	9	--------	57,509	57,518	175,926	98.9	87.9	15.8	--------	38.5	38.5	64.6
Michigan	233,363	56,812	719	--------	75,085	75,804	365,979	99.5	88.1	21.3	--------	53.1	52.4	82.5
Ohio	314,526	90,934	625	--------	129,070	129,695	535,155	80.6	73.1	41.9	--------	53.8	53.7	70.8
Wisconsin	73,067	16,384	--------	--------	35,525	35,525	124,976	124.3	94.4	--------	--------	58.8	58.8	91.5
Total	1,033,929	247,254	3,708	--------	406,695	410,403	1,691,586	98.0	81.8	16.2	--------	47.7	47.1	75.9
West North Central:														
Iowa	64,070	22,619	--------	--------	34,887	34,887	121,576	94.6	68.5	--------	--------	30.9	30.9	56.9
Kansas	47,534	12,519	[1] 6,052	(1)	51,759	57,811	117,864	55.7	45.8	20.1	(1)	21.8	21.6	31.0
Minnesota	79,066	25,213	--------	--------	31,676	31,676	135,955	110.0	66.0	--------	--------	30.4	--------	65.5
Missouri	95,745	24,960	--------	--------	39,985	39,985	160,690	80.2	64.0	--------	--------	30.5	30.5	55.5
Nebraska	35,754	13,081	554	--------	21,672	22,226	71,061	82.8	60.4	12.7	--------	28.2	27.4	48.7
North Dakota	4,078	2,348	1,465	--------	610	2,075	8,501	86.8	58.2	12.4	--------	36.7	15.4	38.3
South Dakota	8,290	4,520	--------	--------	3,432	3,432	16,242	96.9	58.3	--------	--------	30.9	30.9	59.2
Total	334,537	105,260	8,071	--------	184,021	192,092	631,889	83.5	61.5	17.3	(1)	27.3	26.6	53.0

South Atlantic:														
Delaware	8,099	1,321	----------	----------	2,558	2,558	11,978	174.8	150.3	--------	----------	28.5	28.5	82.7
District of Columbia	(2)	(2)	----------	----------	(2)	(2)	(2)	(2)	(2)	--------	----------	(2)	(2)	(2)
Florida	17,511	16,228	112	----------	48,736	48,848	82,587	265.8	155.2	20.6	----------	34.8	34.7	52.4
Georgia	61,883	17,209	----------	----------	37,283	37,283	116,375	105.3	68.3	--------	----------	34.3	34.3	60.4
Maryland	[2] 93,140	[2] 19,140	13	--------	[2] 16,696	[2] 16,709	[2] 128,989	[2] 153.5	[2] 136.9	40.6	----------	[2] 78.7	[2] 78.7	[2] 134.5
North Carolina	17,132	6,537	----------	----------	19,043	19,043	42,712	148.8	138.1	--------	----------	47.7	47.7	75.8
South Carolina	13,517	6,363	----------	----------	23,202	23,202	43,082	147.5	102.3	--------	----------	42.0	42.0	61.0
Virginia	49,373	14,142	56	----------	15,740	15,796	79,311	158.0	108.3	78.9	----------	47.9	47.9	102.7
West Virginia	42,167	11,596	9,746	----------	37,558	47,304	101,067	84.9	69.2	26.2	----------	44.2	38.7	53.6
Total	302,822	92,536	9,927	----------	200,816	210,743	606,101	130.4	101.2	26.1	----------	40.8	39.8	71.0
East South Central:														
Alabama	46,298	16,850	44	----------	39,055	39,099	102,247	109.8	57.9	37.6	----------	31.8	31.8	52.6
Kentucky	50,313	16,179	2,425	----------	25,890	28,315	94,807	81.2	66.3	20.1	----------	37.1	34.6	56.4
Mississippi	21,076	9,091	3,055	----------	38,480	41,535	71,702	88.4	48.9	17.6	----------	27.5	26.4	35.9
Tennessee	28,312	21,560	16	----------	31,336	31,352	81,224	79.7	56.8	20.5	----------	33.3	33.3	48.4
Total	145,999	63,680	5,540	----------	134,761	140,301	349,980	89.3	57.9	18.7	----------	31.6	30.7	47.9
West South Central:														
Arkansas	23,659	9,238	1,611	----------	39,201	40,812	73,709	70.2	45.9	16.9	----------	24.3	23.9	32.8
Louisiana	40,276	8,928	34,952	2,455	158,049	195.456	244,660	69.3	44.9	15.4	13.6	23.1	21.0	24.3
Oklahoma	45,294	12,200	21.234	----------	51,106	72,340	129,834	71.9	51.1	13.1	----------	21.5	18.1	26.7
Texas	157,021	36,303	124,102	9,338	334,532	467,972	661,296	79.9	53.5	11.0	11.0	19.3	15.9	20.6
Total	266,250	66,669	181,899	11,793	582,888	776,580	1,109,499	75.8	54.1	11.8	11.4	20.7	17.4	22.5
Mountain:														
Arizona	20,483	7,049	----------	----------	43,671	43,671	71,203	92.4	56.3	--------	----------	35.4	35.4	45.1
Colorado	38,309	17,151	1,873	----------	24,332	26,205	81,665	67.0	53.7	14.8	----------	23.6	22.6	39.8
Idaho	4,169	3,726	----------	----------	7,179	7,179	15,074	130.9	85.2	--------	----------	39.3	39.3	58.4
Montana	12,913	6,258	627	----------	6,726	7,353	26,524	75.2	50.6	9.1	----------	25.1	21.8	41.9
Nevada	1,948	762	----------	----------	9,462	9,462	12,172	131.7	96.8	--------	----------	62.0	62.0	69.4
New Mexico	19,171	6,359	13,099	2,203	20,550	35,852	61,382	81.5	49.8	11.9	8.2	17.2	14.0	21.0
Utah	21,524	6,281	1,889	----------	12,743	14,632	42,437	76.7	53.0	18.4	----------	29.8	27.6	45.7
Wyoming	6,070	2,821	2,276	--------	4,654	6,930	15,821	60.6	42.6	8.4	----------	19.7	13.7	23.5
Total	124,587	50,407	19,764	2,203	129,317	151,284	326,278	76.6	54.1	11.8	8.2	27.4	22.7	35.4
Pacific:														
Alaska	523	15	34	----------	1,068	1,102	1,640	97.4	83.3	16.0	----------	78.0	69.7	76.7
California	414,034	86,786	[1] 52,106	(1)	315,929	368,035	868,855	99.7	69.9	31.4	(1)	41.0	39.3	58.9
Oregon	12,208	5,229	----------	----------	10,728	10,728	28,165	153.0	146.8	--------	----------	40.8	40.8	74.4
Washington	14,712	7,969	----------	----------	24,954	24,954	47,635	148.1	100.3	--------	----------	39.3	39.3	58.5
Total	441,477	99,999	[1] 52,140	----------	352,679	404,819	946,295	101.7	73.6	31.4	(1)	40.9	92.1	59.2
Total: 1962	3,629,478	940,185	[1] 281,523	[1] 15,001	2,278,503	2,575,027	7,144,690	104.3	77.9	14.1	11.3	32.2	28.0	51.4
1961	3,475,237	838,060	244,589	16,728	2,092,792	2,354,109	6,667,406	107.0	77.8	13.0	10.4	31.2	26.9	51.0

---

[1] 1,005 thousand dollars in value included in "Field" to avoid disclosure; included in "Carbon black" United States total.
[2] Included with Maryland to avoid diselosure.

TABLE 13.—Natural gas processed at natural gas processing plants in the United States

(Million cubic feet)

State	1958	1959	1960	1961	1962
Arkansas	42,538	73,503	120,943	112,490	121,911
California	612,389	527,297	548,406	553,734	539,594
Colorado	[1] 61,251	[1] 101,253	84,322	96,177	83,643
Illinois	[2] 200,397	[2] 197,246	[3] 194,679	[3] 198,964	[3] 197,180
Kansas	390,814	432,068	451,676	508,213	592,035
Kentucky	[3] 288,907	[3] 375,591	[3 4] 273,558	[3 4] 295,314	[3 4] 329,137
Louisiana	973,299	1,047,481	1,491,078	1,694,071	2,015,188
Michigan	(2)	(2)	(4)	(4)	(4)
Mississippi	171,008	180,583	131,369	108,156	95,486
Montana	(1)	(1)	[5] 41,480	[5] 55,850	[5] 53,890
Nebraska [6]	35,205	37,680	41,663	40,388	34,837
New Mexico	563,227	652,976	662,479	665,602	732,421
Oklahoma	651,077	708,616	760,743	798,653	880,422
Pennsylvania	5,358	2,932	2,639	2,612	2,555
Texas	4,233,619	4,508,288	4,578,623	4,771,916	4,997,825
Utah	(1)	(1)	(5)	(5)	(5)
West Virginia	156,653	215,979	214,372	209,753	[7] 241,136
Wyoming	66,802	125,369	170,159	149,776	171,981
Total	8,452,544	9,186,862	9,768,189	10,261,669	11,089,241

[1] Montana and Utah included in Colorado.
[2] Michigan and Ohio included in Illinois.
[3] Includes gas from transmission lines; previously treated in other States.
[4] Michigan included in Kentucky.
[5] Utah included in Montana.
[6] North Dakota included in Nebraska.
[7] Florida included in West Virginia.

TABLE 14.—Consumption of natural gas used with manufactured gas in the United States[1]

State	Residential		Commercial		Industrial	Total	
	Number of consumers (thousand)	Quantity (million cubic feet)	Number of consumers (thousand)	Quantity (million cubic feet)	Quantity (million cubic feet)	Quantity (million cubic feet)	Value at point of consumption (thousand dollars)
Connecticut	111	3,727	7	856	915	5,498	10,435
Indiana	158	14,137	8	3,138	6,359	23,634	15,362
New Jersey	329	13,575	24	1,662	6,832	22,069	33,478
New York	372	62,440	47	11,399	20,377	94,216	76,993
Pennsylvania	764	57,586	34	5,549	45,041	108,176	126,846
Total:							
1962	1,734	151,465	120	22,604	79,524	253,593	263,114
1961	2,089	154,942	120	23,821	58,974	237,737	334,896

[1] Included in tables for consumption of natural gas (tables 10–12).

VALUE AND PRICE

The average value of natural gas at the wellhead in 1962 was 15.5 cents per thousand cubic feet, an increase of 0.4 cent over the 1961 average value. The average value at point of consumption was 51.4 cents per thousand cubic feet in 1962 compared with 51.0 cents per thousand for the previous year.

The estimated total value of natural gas produced in 1962 was $2,145,301,000, and the total value at point of consumption for the year was $7,144,690,000.

TABLE 15.—Average value of natural gas in the United States

(Cents per thousand cubic feet)

State	At wells (estimated)		At point of consumption		State	At wells (estimated)		At point of consumption	
	1961	1962	1961	1962		1961	1962	1961	1962
Alabama	7.4	9.8	54.2	52.6	Nebraska	16.7	18.2	47.8	48.7
Alaska	20.4	21.4	33.9	76.7	Nevada	------	------	70.0	69.4
Arizona	------	11.9	47.7	45.1	New Hampshire	------	------	159.7	168.4
Arkansas	13.5	14.9	31.9	32.8	New Jersey	------	------	148.9	143.3
California	28.3	29.0	57.1	58.9	New Mexico	10.9	11.5	19.9	21.0
Colorado	11.6	11.6	39.1	39.8	New York	29.5	28.1	133.4	115.5
Connecticut	------	------	168.2	167.1	North Carolina	------	------	73.9	75.8
Delaware	------	------	112.5	82.7	North Dakota	12.6	13.7	37.0	38.3
District of Columbia	------	------	151.5	148.4	Ohio	24.9	25.6	70.4	70.8
Florida	18.9	20.7	52.3	52.4	Oklahoma	12.1	12.8	27.2	26.7
Georgia	------	------	61.4	60.4	Oregon	------	------	74.2	74.4
Idaho	------	------	55.8	58.4	Pennsylvania	29.4	27.2	82.3	82.3
Illinois	12.8	14.3	73.1	78.9	Rhode Island	------	------	162.9	161.1
Indiana	20.1	21.1	63.2	64.6	South Carolina	------	------	60.1	61.0
Iowa	------	------	55.2	56.9	South Dakota	------	------	58.6	59.2
Kansas	12.5	12.4	31.6	31.0	Tennessee	18.3	18.5	44.6	48.4
Kentucky	24.8	24.8	56.2	56.4	Texas	12.3	12.3	19.6	20.6
Louisiana	18.7	19.7	22.9	24.3	Utah	15.7	16.8	44.8	45.7
Maryland	27.2	27.0	135.7	131.0	Virginia	27.1	27.1	103.8	102.7
Massachusetts	------	------	173.3	169.6	Washington	------	------	57.5	58.5
Michigan	21.1	21.3	82.3	82.5	West Virginia	27.4	27.5	54.4	53.6
Minnesota	------	------	66.9	63.5	Wisconsin	------	------	95.3	91.5
Mississippi	18.6	19.0	35.8	35.9	Wyoming	12.5	14.6	25.3	23.5
Missouri	24.7	25.0	55.7	55.5					
Montana	7.4	7.4	40.3	41.9	Total	15.1	15.5	51.0	51.4

WORLD PRODUCTION

Known marketed production of natural gas produced in all countries has been recorded in million cubic feet by the Bureau of Mines. The data are comparable to Bureau of Mines natural gas statistics as far as possible, that is, marketed production. However, gases used for repressuring and gases flared, vented, or otherwise wasted are excluded from the data.

The proved recoverable natural gas reserves in the Dominion of Canada at the end of 1962 were estimated at 35.4 trillion cubic feet, of which 82 percent are located in the Province of Alberta.

TABLE 16.—Marketed production of natural gas by countries[1] at 60° F. (15.56° C) and normal atmospheric pressure

(Million cubic feet)

Country[1]	1958	1959	1960	1961	1962
North America:					
Barbados	98	86	88	109	120
Canada	337,804	417,335	522,972	657,892	946,860
Mexico[2]	277,576	348,112	360,691	381,027	371,225
Trinidad	23,403	25,206	27,042	29,367	29,749
United States	11,030,298	12,046,115	12,771,038	13,254,025	13,876,622
South America:					
Argentina	32,328	32,119	51,607	87,963	(3)
Brazil[2]	11,213	15,994	19,962	19,663	19,082
Chile[2]	49,858	67,746	81,873	95,120	132,844
Colombia[2]	29,632	33,887	30,341	29,222	31,107
Peru[2]	33,762	34,171	(3)	(3)	42,320
Venezuela	158,247	167,675	179,824	189,430	194,363
Europe:					
Austria	30,613	42,098	54,830	58,073	61,013
Czechoslovakia	46,501	[4] 59,980	161,633	(3)	(3)
France	21,367	50,804	106,199	151,951	176,886
Germany, West	12,832	14,466	16,717	17,960	17,970
Hungary[2]	13,995	12,353	12,694	12,080	12,674
Italy	193,156	228,307	240,610	256,129	266,832
Netherlands	7,763	9,330	12,316	18,212	22,392
Poland	14,267	15,589	20,205	26,956	30,625
Rumania	189,410	215,797	243,304	268,603	329,805
U.S.S.R	1,115,495	1,388,304	1,754,040	2,201,182	2,649,720
Yugoslavia	1,719	1,866	1,976	2,566	3,557
Asia:					
Brunei	2,757	2,847	3,043	3,005	(3)
Burma	325	178	261	333	440
India	4,725	4,794	5,201	(3)	(3)
Indonesia[2]	77,887	83,224	90,725	95,577	[4] 95,767
Iran	26,288	32,055	36,299	104,221	107,161
Iraq	----------	12,358	22,311	23,569	(3)
Israel	----------	----------	1,203	10,550	39,619
Japan[2]	13,730	18,913	27,297	35,464	45,137
Pakistan	19,308	22,365	29,842	34,665	42,076
Taiwan	979	983	949	1,383	1,433
Africa:					
Algeria (Sahara)	[2] 4,083	[2] 13,786	(3)	8,615	13,189
Gabon, Republic of	15	258	278	249	328
Morocco	69	154	352	299	(3)
Tunisia	218	225	252	256	267
Oceania: New Zealand	5	5	5	5	5

[1] Natural gas is produced in China, but, there is no recent information available.
[2] Total production.
[3] Data not available.
[4] Estimate.

NOTE: The data relate, as far as possible, to natural gas actually collected and utilized as fuel or raw material. They exclude gas used for repressuring, as well as gas flared, vented, or otherwise wasted, whether or not it has first been processed for the extraction of natural gasoline.

For countries reporting in the metric system, the following conversion factor is used:

m^3 at 32° F. (0° C.) x 37.32=$ft.^3$ at 60° F.
($ft.^3$ at 60° F. x 0.026795=m^3 at 32° F.)

Compiled by Liela S. Price, Division of Foreign Activities.

Natural Gas Liquids

By I. F. Avery,[1] W. G. Messner,[2] B. D. Furgang,[3] and E. R. Eliff[4]

◆

Contents

	Page
General summary	343
Scope of report	344
Districts	345
Reserves	347
Production	348
Natural gas processed yield, and number of plants	352
Demand for natural gas liquids at plants and terminals	353
Prices	358
Stocks	359
Storage	359
Shipments of liquefied petroleum gases and ethane	361
Foreign trade	370

GENERAL SUMMARY

NATURAL gas processing plants increased their output in 1962 by 3.0 percent. The total production for the year was 15,654 million gallons. A breakdown of this production and the percentage change from 1961 are as follows: Natural gasoline and isopentane, 4,772 million gallons, a gain of 2.3 percent; liquefied petroleum (LP) gases and ethane, 9,409 million gallons, a gain of 3.6 percent; finished gasoline and naphtha, 451 million gallons, a 4.8-percent decline; and other finished products, 1,022 million gallons, a gain of 5.8 percent. Included in "other finished products" are raw condensate, kerosine, distillate fuel oil, jet fuel, and miscellaneous finished products.

Shipments of natural gas liquids to refineries and terminals for use as blending material in motor fuel totaled 8,236 million gallons in 1962, compared with 7,973 million in 1961. Natural gas liquids accounted for 12.2 percent of the total motor fuel produced in 1962. Shipments of liquefied gases and ethane, which include LP gases produced at plants and liquefied refinery (LR) gases produced at petroleum refineries, totaled 10,729 million gallons, a 9-percent increase for the year.

The total value of the natural gas liquids produced at plants in 1962 was $798,151,000. The average value per gallon (5.1 cents) remained unchanged for the third year.

---

[1] Supervisory mineral specialist (petroleum), Division of Statistics.
[2] Mineral specialist (petroleum), Division of Statistics.
[3] Statistical clerk, Division of Statistics.
[4] Statistical assistant, Division of Statistics.

SCOPE OF REPORT

Statistics on natural gas liquids are collected by the Bureau of Mines from reports submitted by natural gasoline plants, cycling plants, and fractionators that handle natural gas liquids. Information on production, stocks, and distribution is obtained from monthly reports. Annual reports provide data on type of plant, production, value of production, and volume of gas processed. Reports submitted to the Bureau cover all except the small volume of natural gas liquids recovered at pipeline compressor stations and gas-dehydration plants. Such recovery is considered to be of little significance in the national and State totals. Plant condensate is included in the category of natural gas liquids. Field condensate, however, is reported with crude oil and is excluded from the total for natural gas liquids. LR gases and ethane produced at petroleum refineries are not natural gas liquids, but to obtain complete distribution of liquefied gases, the sales data shown in this chapter cover the products of natural gasoline plants and petroleum refineries.

Data on shipments of LP gases are collected by the Bureau from annual reports received from all producers and distributors and from most of the dealers that sell over 100,000 gallons of LP gases annually. The reported sample of dealer shipments is expanded by Petroleum Administration for Defense (PAD) districts on the basis of the domestic demand in the districts.

Data on shipments of LP gases used as fuels or chemicals include data on ethane and liquefied gas produced at natural gasoline plants and at petroleum refineries; they exclude, however, data on LP gases blended into motor fuel.

Liquefied gases and ethane, whether obtained from natural gas or from processing in refineries, are defined as follows:

Ethane.—Includes all ethane, ethylene, and mixtures containing more than 50 percent of either.

Propane.—Includes all products covered by Natural Gas Processors Association specifications for commercial propane.

Butane-propane mixture.—Includes all products covered by NGPA specifications for commercial butane-propane mixtures.

Butanes.—Includes all products covered by NGPA specifications for commercial butane, except those that contain 60 percent or more isobutane.

Isobutane.—Includes all products covered by NGPA specifications for commercial butane that contain 60 percent or more isobutane.

Other mixtures of liquefied petroleum gases.—Includes mixtures that cannot be classified within the five classifications mentioned, such as mixtures containing less than 50 percent ethane but more than 50 percent propane and butane.

TABLE 1.—Salient statistics of the natural gas liquids industry in the United States, 1958–62

(Thousands of gallons unless otherwise stated)

	1958	1959	1960	1961	1962
Production:					
Natural gasoline and isopentane	4,355,025	4,222,266	4,479,454	4,666,319	4,772,260
LP gases and ethane	6,783,000	7,874,706	8,444,074	9,085,465	9,409,083
Finished gasoline and naphtha	701,456	660,666	503,659	473,496	450,991
Other finished products and condensate	539,977	714,170	859,394	965,648	1,021,271
Total	12,379,458	13,471,808	14,286,581	15,190,928	15,653,605
Shipments for use in gasoline: [1]	6,904,179	7,067,963	7,522,372	7,973,162	8,235,864
Transfers to nongasoline uses (fuel and chemical):					
LP gases and ethane [2]	5,174,140	6,149,430	6,391,217	6,693,573	7,506,776
Other finished products	191,077	158,708	212,483	197,823	171,165
Stocks at plants, terminals, and refineries:					
Natural gasoline	198,284	170,058	197,559	198,608	174,835
LP gases	664,705	790,579	946,758	1,294,090	1,057,295
Other finished products	92,595	84,606	70,507	64,120	86,034
Total	955,584	1,046,243	1,214,824	1,556,818	1,318,164
Value of natural gas liquids at plants thousand dollars	689,710	758,496	808,385	782,205	798,151
Average value per gallon cents	5.6	5.6	5.7	5.1	5.1
Natural gas processed million cubic feet	8,452,544	9,186,862	9,768,189	10,261,669	11,089,241
Average yield, all natural gas liquids gallons per thousand cubic feet	1.46	1.47	1.46	1.48	1.41
Shipments for fuel and chemical uses:					
Liquefied petroleum gas and ethane (LP gases)	5,054,271	6,047,061	6,332,699	6,482,109	7,502,702
Liquefied refinery gas and ethane (LR gases)	2,407,818	2,872,100	3,211,950	3,315,774	3,226,692
Total	7,462,089	8,919,161	9,544,649	9,797,883	10,729,394
Exports of natural gasoline, LP gases, and LR gases	120,017	94,620	125,590	149,722	162,708
Imports of LP gases and LR gases	(3)	(3)	68,502	75,852	94,416

---

[1] Includes exports of natural gasoline.
[2] Includes exports of LP gases.
[3] Imports of liquefied gases included with gasoline.

DISTRICTS

The Bureau reports the production of natural gas liquids by States. Louisiana and Texas are also reported by districts.

Louisiana is divided into an Inland district and a Gulf Coast district. The Gulf Coast district includes Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, and Washington Parishes and all parishes in the State south of these. All parishes not included in the Gulf Coast district are in the Inland district.

The Bureau of Mines producing districts in Texas correspond, with one exception, to groupings of the Texas Railroad Commission districts:

Bureau of Mines districts:	*Railroad Commission district*
Gulf Coast	Nos. 2 and 3.
West Texas	Nos. 7c and 8.
East Proper	Part of No. 6 (East Texas field in Cherokee, Smith, Upshur, Rush, and Gregg Counties).
Panhandle	No. 10.
West of State:	
North	Nos. 7b and 9.
Central	No. 1.
South	No. 4.
Other East Texas	Nos. 5 and 6 (exclusive of East Texas field).

The Bureau groups refinery operations into another set of districts called refining districts. These refining districts correspond with the groupings originated by the Petroleum Administration for War during World War II and called PAW districts (later changed to PAD districts):

PAD district	*Refining districts*
1	*East Coast*—District of Columbia, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida, and the following counties of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof; and the following counties of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.
1	*Appalachian No. 1*—West Virginia and those part of Pennsylvania and New York not included in the East Coast district.
2	*Appalachian No. 2*—The following counties of Ohio: Erie, Huron, Crawford, Marion, Delaware, Franklin, Pickaway, Ross, Pike, Scioto, and all counties east thereof.
2	*Indiana-Illinois-Kentucky*—Indiana, Illinois, Kentucky, Tennessee, Michigan, and that part of Ohio not included in the Appalachian district.
2	*Oklahoma-Kansas-Missouri*—Oklahoma, Kansas, Missouri, Nebraska, and Iowa.
2	*Minnesota-Wisconsin-North Dakota-South Dakota*—Minnesota, Wisconsin, North Dakota, and South Dakota.
3	*Texas Inland*—Texas, except Texas Gulf Coast district.
3	*Texas Gulf Coast*—The following counties of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.
3	*Louisiana Gulf Coast*—The following parishes of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, Washington, and all parishes south thereof; the following counties of Mississippi: Pearl River, Stone, George, Hancock, Harrison; and Jackson, and Mobile and Baldwin Counties, Ala.
3	*North Louisiana-Arkansas*—Arkansas and those parts of Louisiana, Mississippi, and Alabama not included in the Louisiana Gulf Coast district.
3	*New Mexico*—New Mexico.
4	*Rocky Mountain*—Montana, Idaho, Wyoming, Utah, and Colorado.
5	*West Coast*—Washington, Orgeon, California, Nevada, Alaska, Arizona, and Hawaii.

Some data in this chapter are based on the Bureau of Mines refining districts, while others refer to the PAD districts. Maps showing the PAD and Bureau of Mines refining districts appear in the "Petroleum" chapter of the Minerals Yearbook.

RESERVES

The American Gas Association Reserves Committee has estimated the total proved reserves of natural gas liquids in the United States, as of December 31, 1962, to be 7,312 million barrels. This represents an increase of 262 million barrels for the year. Of the 10 States reporting increases in proved reserves, Louisiana accounted for the largest increase (204 million barrels), followed by Texas with 74 million barrels. Reserves declined in 12 States in 1962. Proved reserves of natural gas liquids can increase both by the discovery of new fields and by the construction of a gasoline plant in an existing field that insures improved recovery from that field.

TABLE 2.—Estimated proved recoverable reserves of natural gas liquids [1] in the United States

(Thousand barrels)

State	Reserves as of Dec. 31, 1961	Changes in reserves during 1962			Reserves as of December 31, 1962			
		Extensions and revisions	Discoveries of new fields and new pools in old fields	Net production	Nonassociated with oil	Associated with oil	Dissolved in oil	Total
Arkansas	22,233	−109	17	2,397	1,736	9,461	8,547	19,744
California [2]	334,212	−8,676	25	25,876	0	97,762	201,923	299,685
Colorado	20,777	3,754	409	3,579	3,543	1,894	15,924	21,361
Illinois	9,049	−3,479	280	874	0	0	4,976	4,976
Indiana	102	9	1	19	4	4	85	93
Kansas	183,579	2,778	213	7,474	168,052	8,144	2,900	179,096
Kentucky	49,795	2,682	1,341	3,152	50,666	0	0	50,666
Louisiana [2]	1,493,838	255,071	53,520	104,620	1,435,181	209,384	53,244	1,697,809
Michigan	4,316	1,898	92	882	2,001	1,293	2,130	5,424
Mississippi	34,879	2,111	1,321	2,296	26,698	3,137	6,180	36,015
Montana	11,112	0	0	624	2,029	0	8,459	10,488
Nebraska	3,851	385	0	443	2,052	174	1,567	3,793
New Mexico	501,246	44,367	1,810	30,214	332,944	47,073	137,192	517,209
North Dakota	84,305	−3,276	0	2,254	0	7,400	71,375	78,775
Oklahoma	329,180	34,311	5,886	22,374	195,535	45,980	105,488	347,003
Pennsylvania	2,070	−500	0	64	[3] 1,506	0	0	1,506
Texas [2]	3,755,497	236,597	84,202	246,915	1,892,521	649,378	1,287,482	3,829,381
Utah	50,418	90	0	1,720	12,605	0	36,183	48,788
West Virginia	58,238	5,304	2,652	7,335	58,859	0	0	58,859
Wyoming	100,386	7,254	210	7,015	51,727	804	48,304	100,835
Miscellaneous [4]	13	−1	0	1	0	0	11	11
Total	7,049,096	580,570	151,979	470,128	4,237,659	1,081,888	1,991,970	7,311,517

[1] Comprises natural gasoline, LP-gases, and condensate.
[2] Includes offshore reserves.
[3] Not allocated by types but occurring principally in column shown.
[4] Includes Alabama and Florida.

PRODUCTION

Another production record for natural gas liquids was established in 1962; the 15,654 million gallons produced exceeded the previous record, set in 1961, by 463 million gallons. LP gases and ethane accounted for 60 percent of the output; natural gasoline and isopentane, 30 percent; other finished products, 7 percent; and finished gasoline and naphtha, 3 percent.

Production of ethane increased 142.2 million gallons; condensate production, 74.0 million gallons; propane, 69.4 million gallons; and other LP gas mixtures, 62.8 million barrels. Natural gas liquids plants reported a 22.5-million-gallon decline in the output of finished gasoline and naphtha and an 18.4-million-gallon decline in the production of other finished products.

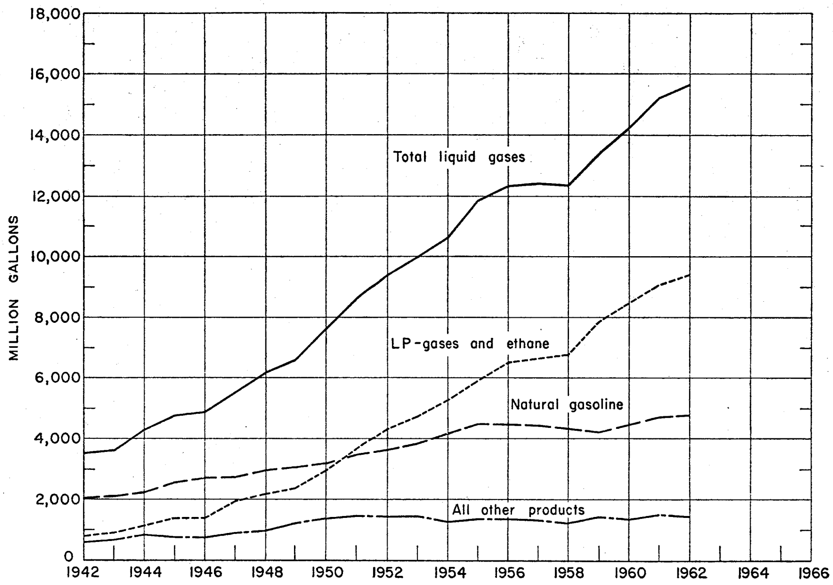


FIGURE 1.—Production of natural gas liquids in the United States, 1942–66.

TABLE 3.—Natural gas liquids produced, value at plants, and gas processed in the United States in 1962, by States

State	Number of operators[2]	Natural gasoline[1]			LP gases and ethane			Finished gasoline and naphtha		
		Thousand gallons	Thousand dollars	Cents per gallon	Thousand gallons	Thousand dollars	Cents per gallon	Thousand gallons	Thousand dollars	Cents per gallon
Arkansas	5	25,405	1,440	5.7	69,452	2,432	3.5	1,552	110	7.1
California	20	679,525	51,380	7.6	407,378	19,294	4.7	-------	-------	-------
Colorado	8	60,558	3,826	6.3	100,787	4,411	4.4	-------	-------	-------
Illinois	3	12,557	945	7.5	327,616	13,812	4.2	758	78	10.3
Kansas	11	148,038	7,551	5.1	166,769	6,295	4.0	-------	-------	-------
Kentucky[3]	8	25,322	1,957	7.7	252,346	10,842	4.3	-------	-------	-------
Louisiana	38	397,927	26,690	6.7	862,772	29,037	3.4	193,842	16,894	8.7
Mississippi	5	24,453	1,524	6.2	20,401	732	3.6	-------	-------	-------
Montana[4]	4	34,257	2,661	7.8	86,115	3,679	4.3	-------	-------	-------
Nebraska	3	12,239	809	6.6	28,718	1,329	4.6	-------	-------	-------
New Mexico	12	268,426	16,441	6.1	661,330	20,359	3.1	-------	-------	-------
North Dakota	3	16,872	1,085	6.4	68,881	2,665	3.9	-------	-------	-------
Oklahoma	36	466,813	29,737	6.4	838,903	25,223	3.0	2,138	311	14.5
Pennsylvania	4	1,350	75	5.6	1,521	112	7.4	-------	-------	-------
Texas	94	2,487,216	180,717	7.3	5,012,291	189,382	3.8	252,701	19,954	7.9
West Virginia[5]	9	34,622	2,340	6.8	354,365	17,968	5.1	-------	-------	-------
Wyoming	9	76,680	4,787	6.2	149,438	5,762	3.9	-------	-------	-------
Total	177	4,772,260	333,965	7.0	9,409,083	353,334	3.8	450,991	37,347	8.3

State	Other products[6]			Total natural gas liquids			Natural gas processed	
	Thousand gallons	Thousand dollars	Cents per gallon	Thousand gallons	Thousand dollars	Cents per gallon	Million cubic feet	Average yield (gallons) per cubic feet
Arkansas	2,458	123	5.0	98,867	4,105	4.2	121,911	0.81
California	37,379	3,080	8.2	1,124,282	73,754	6.6	539,594	2.08
Colorado	-------	-------	-------	161,345	8,237	5.1	83,643	1.93
Illinois	-------	-------	-------	340,931	14,835	4.4	[7] 197,180	1.73
Kansas	3,322	145	4.4	318,129	13,991	4.4	592,035	.54
Kentucky[3]	-------	-------	-------	277,668	12,799	4.6	[7] 329,137	.84
Louisiana	418,368	31,142	7.4	1,872,909	103,763	5.5	2,015,188	.93
Mississippi	1,438	92	6.2	46,292	2,348	5.1	95,486	.48
Montana[4]	-------	-------	-------	120,372	6,340	5.3	53,890	2.23
Nebraska	-------	-------	-------	40,957	2,138	5.2	11,675	3.51
New Mexico	5,543	334	6.0	935,299	37,134	4.0	732,421	1.28
North Dakota	-------	-------	-------	85,753	3,750	4.4	23,162	3.70
Oklahoma	83,844	5,716	-------	1,391,698	60,987	4.4	880,422	1.58
Pennsylvania	-------	-------	-------	2,871	187	6.5	2,555	1.12
Texas	465,600	32,674	4.1	8,217,808	422,727	5.1	4,997,825	1.64
West Virginia[5]	1,219	51	4.2	390,206	20,359	5.2	[7] 241,136	1.62
Wyoming	2,100	148	7.0	228,218	10,697	4.7	171,981	1.33
Total	1,021,271	73,505	7.2	15,653,605	798,151	5.1	11,089,241	1.41

---

[1] Includes isopentane.

[2] A producer operating in more than 1 State is counted but once in arriving at total United States.

[3] Michigan (3 operators) included with Kentucky.

[4] Utah (2 operators) included with Montana.

[5] Florida (1 operator) included with West Virginia.

[6] Includes condensate, kerosine, jet fuel, distillate, etc.

[7] Includes gas from transmission lines previously treated in another State.

TABLE 4.—Monthly production of natural gas liquids in the United States in 1962, by States and districts [1]

(Thousand gallons)

States by petroleum districts [1]	January	February	March	April	May	June	July	August	September	October	November	December	Total
District 1:													
Western Pennsylvania	331	315	295	230	207	163	129	180	228	254	257	282	2,871
West Virginia and Florida	33,164	30,822	32,831	31,508	28,911	30,488	31,185	31,135	30,916	31,583	38,256	39,407	390,206
Total	33,495	31,137	33,126	31,738	29,118	30,651	31,314	31,315	31,144	31,837	38,513	39,689	393,077
District 2:													
Illinois	29,589	29,276	29,625	30,470	28,601	26,176	25,630	27,517	27,174	28,193	28,795	29,885	340,931
Kentucky and Michigan	25,204	22,848	25,314	21,667	24,212	22,221	23,031	25,327	23,070	22,241	20,386	22,147	277,668
Kansas	32,181	26,655	27,697	24,243	22,459	22,228	21,960	22,710	23,942	28,859	31,517	33,678	318,129
Nebraska	4,802	4,407	4,451	3,698	3,327	2,997	2,824	2,707	2,688	2,731	3,039	3,286	40,957
North Dakota	6,505	5,628	6,165	5,471	6,691	6,941	7,861	7,629	7,081	8,790	8,169	8,822	85,753
Oklahoma	123,234	115,795	129,231	116,720	109,937	104,673	107,900	110,447	111,209	115,798	120,781	125,973	1,391,698
Total	221,515	204,609	222,483	202,269	195,227	185,236	189,206	196,337	195,164	206,612	212,687	223,791	2,455,136
District 3:													
Arkansas	8,213	8,035	8,511	8,547	8,397	8,292	8,585	8,573	7,163	8,255	8,120	8,176	98,867
Louisiana:													
Gulf	107,277	102,050	112,503	107,098	102,827	99,557	104,086	99,012	100,913	107,206	124,868	142,277	1,309,674
Inland	51,749	46,684	49,928	46,852	46,782	43,129	43,448	42,154	43,494	46,788	48,914	53,313	563,235
Total Louisiana	159,026	148,734	162,431	153,950	149,609	142,686	147,534	141,166	144,407	153,994	173,782	195,590	1,872,909
Mississippi and Alabama	3,567	3,550	3,703	3,780	3,794	3,779	3,768	3,918	3,965	4,199	4,129	4,140	46,292
New Mexico	76,874	74,157	83,200	78,154	82,296	74,351	68,396	75,375	76,132	90,083	74,113	82,168	935,299
Texas:													
Gulf	157,741	144,761	155,494	146,507	153,721	151,192	155,815	156,705	152,920	160,912	159,710	168,468	1,863,946
West	215,325	200,752	216,692	214,664	223,173	220,702	246,271	241,356	247,971	229,867	218,555	212,274	2,687,602
East (field)	14,512	14,020	14,384	14,572	14,939	14,908	14,967	23,964	21,066	21,413	20,881	21,112	210,738
Panhandle	104,451	87,096	98,465	106,524	102,915	89,578	119,394	88,752	89,550	97,540	95,494	103,138	1,182,897
Rest of State (other)	204,218	185,643	205,800	188,454	186,758	178,376	186,917	181,440	173,942	183,524	199,486	198,067	2,272,625
Total Texas	696,247	632,272	690,835	670,721	681,506	654,756	723,364	692,217	685,449	693,256	694,126	703,059	8,217,808
Total	943,927	866,748	948,680	915,152	925,602	883,864	951,647	921,249	917,116	949,787	954,270	993,133	11,171,175

District 4:													
Colorado	15, 238	12, 760	14, 766	12, 915	12, 480	12, 059	12, 724	12, 342	11, 905	13, 346	15, 683	15, 127	161, 345
Montana and Utah	8, 676	8, 095	9, 229	11, 035	10, 574	10, 305	11, 449	10, 725	10, 748	10, 128	9, 414	9, 994	120, 372
Wyoming	19, 813	18, 737	20, 833	17, 916	18, 177	16, 611	17, 246	18, 840	18, 679	19, 796	19, 964	21, 633	228, 218
Total	43, 727	39, 592	44, 828	41, 866	41, 231	38, 975	41, 419	41, 907	41, 332	43, 270	45, 061	46, 754	509, 935
District 5	100, 892	88, 713	99, 300	88, 667	90, 258	90, 317	93, 126	93, 425	89, 747	95, 902	94, 482	99, 453	1, 124, 282
Grand total	1, 343, 556	1, 230, 799	1, 348, 417	1, 279, 692	1, 281, 436	1, 229, 043	1, 306, 712	1, 284, 233	1, 274, 503	1, 327, 381	1, 345, 013	1, 402, 820	15, 653, 605

---

[1] West Pennsylvania separated from eastern part of State to allow grouping in either Bureau of Mines refinery district or Petroleum Administration for Defense district. Districts shown for Texas and Louisiana are Bureau of Mines production districts. (These districts are described under the heading "Districts.")

NATURAL GAS PROCESSED, YIELD, AND NUMBER OF PLANTS

There were 616 natural gas liquids processing plants in operation as of December 31, 1962, compared with 598 at the end of 1961. The average annual output per plant increased from 25,403 million gallons in 1961 to 25,412 million gallons in 1962. These plants processed 11,089 billion cubic feet of natural gas. The average yield was 1.41 gallons per thousand cubic feet of natural gas processed.

TABLE 5.—Natural gas liquids produced in the United States in 1962, by States and methods of production

State	Number of plants operating, Dec. 31, 1962					
	Absorption	Compression	Refrigeration and adsorption	Combination	Cycling	Total
Arkansas	4			1		5
California	49	6	3	5	2	65
Colorado	7	2	4			13
Florida				1		1
Illinois	3					3
Kansas	13	2	1			16
Kentucky	3			1		4
Louisiana	41	3	7	2	13	66
Michigan	1	2				3
Mississippi	2		2	1	1	6
Montana	2					2
Nebraska	4			1		5
New Mexico	23		3	3		29
North Dakota	2			1		3
Oklahoma	59	4	2	3	2	70
Pennsylvania	4	2				6
Texas	203	7	13	21	24	268
Utah	2					2
West Virginia	5	29	1			35
Wyoming	8	2	1	3		14
Total:						
1962	435	59	37	43	42	616
1961	426	57	36	34	45	598

State	Production (thousand gallons)			
	Absorption and combination [1]	Compression, refrigeration, and adsorption [1]	Cycling	Total
Arkansas	98,867			98,867
California	962,739	25,527	136,016	1,124,282
Colorado	47,456	113,889		161,345
Florida	(2)			(2)
Illinois	340,931			340,931
Kansas	309,754	8,375		318,129
Kentucky	[3] 267,094	[3] 10,574		[2] 277,668
Louisiana	994,319	58,269	820,321	1,872,909
Michigan	(3)	(3)		(3)
Mississippi	(4)	(4)	(4)	46,292
Montana	[5] 120,372			[5] 120,372
Nebraska	40,957			40,957
New Mexico	892,010	43,289		935,299
North Dakota	85,753			85,753
Oklahoma	1,207,858	59,328	124,512	1,391,698
Pennsylvania	2,696	175		2,871
Texas	6,913,356	197,450	1,107,002	8,217,808
Utah	(5)			(5)
West Virginia	[2] 176,602	213,604		[2] 390,206
Wyoming	222,468	5,750		228,218
Total:				
1962	12,710,089	746,804	2,196,712	15,653,605
1961	12,417,408	438,747	2,334,773	15,190,928

[1] Production combined to avoid disclosing individual company operations.
[2] Florida production included with West Virginia.
[3] Michigan production included with Kentucky.
[4] Included with State total production and U.S. total production to avoid disclosing individual company operations.
[5] Utah production included with Montana.

DEMAND FOR NATURAL GAS LIQUIDS AT PLANTS AND TERMINALS

The total demand for natural gas liquids at plants and terminals increased from 14,865 million gallons in 1961 to 15,914 million in 1962, a gain of 7.1 percent. Shipments for the year exceeded production, resulting in a withdrawal from stocks of 260 million gallons.

Motor Fuel Use.—Shipments of natural gas liquids for use as blending material for motor fuel totaled 8,236 million gallons and represented 52 percent of the total demand, compared with 54 percent in 1961.

Other Uses.—Shipments of ethane, used in the production of chemicals, increased 19 percent. LP gases shipped for use in the manufacture of chemicals and for fuel use other than motor fuels totaled 6,659 million gallons, compared with 5,981 million gallons in 1961. Other finished products shipped from natural gas processing plants were jet fuel, 29.8 million gallons; kerosine, 42.3 million gallons; distillate fuel oil, 20.8 million gallons; and miscellaneous finished products, 78.3 million gallons. Details of the uses of liquefied gases are shown later in this chapter under the heading "Shipments of Liquefied Gases and Ethane."

TABLE 6.—Supply and distribution at plants and terminals of natural gas liquids in the United States in 1962, by months

(Thousand gallons)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production:													
Natural gasoline	358,438	312,620	362,833	356,511	363,937	373,100	403,077	379,131	361,970	376,790	372,775	384,391	4,405,573
Ethane	70,464	68,858	67,387	69,608	70,489	74,766	75,429	74,398	69,807	74,013	65,303	71,934	852,456
LP gases:													
Propane	421,047	372,995	410,856	366,118	349,705	334,399	344,832	360,042	360,102	389,389	410,809	432,892	4,553,186
Butane, normal	180,756	168,935	180,204	167,025	178,800	157,556	177,700	158,242	196,164	184,827	191,957	199,015	2,141,181
Isobutane	70,122	70,513	71,600	68,507	67,084	66,313	70,027	74,605	67,820	76,391	70,554	71,539	845,075
Butane-propane mixture	57,334	45,814	60,312	57,819	54,758	57,312	55,892	60,854	46,134	45,603	47,277	49,886	638,995
Other LP gas mixtures	26,311	27,779	34,148	33,575	33,441	32,193	33,762	33,186	35,348	30,928	28,606	28,913	378,190
Isopentane	25,525	44,823	27,182	40,230	44,151	25,828	32,514	27,664	20,303	25,077	27,246	26,144	366,687
Finished gasoline and naphtha	42,260	37,942	39,527	36,933	36,852	34,504	35,662	37,465	34,922	37,344	37,298	40,282	450,991
Condensate, raw	75,040	65,837	79,284	69,373	67,696	60,044	64,094	64,396	68,062	72,359	79,029	82,132	847,346
Other finished products	16,259	14,683	15,084	13,993	14,523	13,028	13,723	14,250	13,871	14,660	14,159	15,692	173,925
Total	1,343,556	1,230,799	1,348,417	1,279,692	1,281,436	1,229,043	1,306,712	1,284,233	1,274,503	1,327,381	1,345,013	1,402,820	15,653,605
Stock change at plants and terminals	−305,517	+841	+17,485	+101,213	+97,976	+76,986	+83,341	+64,945	−5,883	−46,165	−119,778	−225,644	−260,200
Shipments:													
For use in gasoline:													
Natural gasoline	362,921	303,415	355,257	358,715	364,424	372,800	395,449	397,897	367,836	390,696	371,003	386,663	4,427,076
LP gases:													
Propane	3,948	2,814	3,150	3,696	3,738	3,948	5,796	4,074	5,670	2,436	2,016	9,786	51,072
Butane, normal	117,412	79,905	70,447	51,432	62,615	64,004	54,914	58,612	93,264	135,707	174,591	146,380	1,109,283
Isobutane	65,708	61,551	66,473	66,924	71,491	73,546	80,620	85,112	79,188	75,049	64,011	66,686	856,359
Butane-propane mixture	84	966	3,738	----------	42	----------	42	3,486	1,764	----------	42	2,772	12,936
Other LP gas mixtures	7,812	7,350	4,116	10,164	10,290	11,088	12,222	12,432	11,718	12,054	8,694	8,862	116,802
Isopentane	25,971	44,099	28,142	39,630	43,006	25,381	27,869	26,089	28,295	25,864	26,895	27,254	368,495
Finished gasoline and naphtha	33,773	37,234	37,542	40,275	38,924	36,122	39,621	38,527	35,155	41,352	35,383	33,404	447,312
Condensate	72,937	67,923	80,552	69,899	68,025	59,056	62,891	64,704	68,700	72,419	77,549	81,874	846,529
For other uses:													
Ethane	70,464	64,757	70,017	68,070	71,285	73,964	75,977	73,645	68,673	74,100	67,077	70,165	848,194
LP gases:													
Propane	682,285	382,925	422,101	309,107	264,833	277,079	274,580	278,242	305,823	347,295	452,420	587,842	4,584,532
Butane, normal	104,646	95,802	80,162	68,597	88,712	60,369	98,978	82,234	126,325	114,830	105,086	114,076	1,139,817
Isobutane	3,168	2,967	3,204	3,226	3,446	3,546	3,886	4,103	3,817	3,618	3,086	3,215	41,282
Butane-propane mixture	61,874	44,295	56,334	57,875	55,307	57,445	55,997	57,414	42,972	45,308	46,000	48,962	629,783
Other LP gas mixtures	19,205	22,094	33,629	18,246	23,657	19,681	19,770	20,250	26,945	17,871	16,598	25,222	263,168
Other finished products	16,865	11,861	16,068	12,623	13,665	14,028	14,759	12,467	14,241	14,947	14,340	15,301	171,165
Total demand for natural gas liquids at plants and terminals	1,649,073	1,229,958	1,330,932	1,178,479	1,183,460	1,152,057	1,223,371	1,219,288	1,280,386	1,373,546	1,464,791	1,628,464	15,913,805

TABLE 7.—Natural gas liquids utilized at refineries in the United States in 1962, by Bureau of Mines refinery districts and by months [1]

(Thousand gallons)

District [2]	January	February	March	April	May	June	July
East Coast	11,886	9,786	6,132	8,988	5,670	3,906	5,460
Appalachian	756	378	714	588	546	630	714
Indiana, Illinois, Kentucky, etc	60,354	57,078	45,234	39,606	43,050	42,462	52,752
Minnesota, Wisconsin, North Dakota, South Dakota	4,158	3,822	3,486	2,940	2,940	3,612	3,906
Oklahoma, Kansas, Missouri	74,634	53,256	59,094	60,816	61,152	55,482	61,950
Texas:							
Inland	88,956	79,632	84,000	84,252	89,628	83,622	95,760
Gulf Coast	202,860	187,026	208,236	179,340	224,070	226,590	220,794
Total Texas	291,816	266,658	292,236	263,592	313,698	310,212	316,554
Louisiana-Arkansas:							
Louisiana Gulf Coast	70,014	57,288	65,184	65,310	59,850	63,462	65,772
Arkansas, Louisiana Inland	29,358	26,628	30,114	28,854	29,484	27,720	26,754
Total Louisiana-Arkansas	99,372	83,916	95,298	94,164	89,334	91,182	92,526
New Mexico	3,990	3,612	3,528	4,914	5,418	6,132	5,964
Other Rocky Mountain	11,592	11,340	12,768	10,920	12,306	12,390	13,650
West Coast	83,538	76,860	86,688	85,344	85,092	82,236	89,460
Total United States	642,096	566,706	605,178	571,872	619,206	608,244	642,936

District [2]	August	September	October	November	December	Total
East Coast	5,838	6,510	7,476	11,508	21,504	104,664
Appalachian	672	672	924	1,218	1,344	9,156
Indiana, Illinois, Kentucky, etc	42,714	42,252	55,818	52,164	58,170	591,654
Minnesota, Wisconsin, North Dakota, South Dakota	5,292	5,250	5,670	5,376	5,082	51,534
Oklahoma, Kansas, Missouri	67,704	69,090	71,106	77,028	77,868	789,180
Texas:						
Inland	93,702	98,826	90,594	85,470	78,204	1,052,646
Gulf Coast	235,704	235,704	258,552	243,054	242,676	2,664,606
Total Texas	329,406	334,530	349,146	328,524	320,880	3,717,252
Louisiana-Arkansas:						
Louisiana Gulf Coast	69,258	79,548	80,556	83,832	82,446	842,520
Arkansas, Louisiana Inland	26,796	25,578	28,224	29,442	29,274	338,226
Total Louisiana-Arkansas	96,054	105,126	108,780	113,274	111,720	1,180,746
New Mexico	6,720	6,048	5,502	6,048	5,502	63,378
Other Rocky Mountain	17,304	13,566	16,044	15,372	17,388	164,640
West Coast	83,622	77,028	85,176	81,396	87,108	1,003,548
Total United States	655,326	660,072	705,642	691,908	706,566	7,675,752

---

[1] Excludes 560,112,000 gallons of natural gas liquids blended at terminal facilities.
[2] Districts are described under the heading "Districts."

TABLE 8.—Percentage of natural gas liquids in refinery gasoline in the United States by Bureau of Mines refinery districts [1]

Year	East Coast	Appalachian	Indiana, Illinois, Kentucky, etc.	Minnesota, Wisconsin, North Dakota, and South Dakota	Oklahoma, Kansas, Missouri, etc.	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas, Louisiana Inland	Rocky Mountain	West Coast	Total
1958	1.3	(2)	4.8	1.7	9.3	34.8	13.4	8.4	13.1	5.6	13.4	9.7
1959	1.2	(2)	4.4	3.3	10.6	35.6	14.4	11.0	25.3	6.7	12.5	10.4
1960	1.0	(2)	5.3	3.6	11.1	35.6	13.5	13.0	35.7	7.8	13.4	11.0
1961	1.1	(2)	4.9	4.6	12.4	30.9	15.2	13.4	33.9	8.5	12.7	11.2
1962	1.3	0.7	5.1	5.4	12.4	31.0	17.8	14.2	34.2	7.5	11.6	11.9

[1] Bureau of Mines petroleum refining and PAD districts are described under the heading "Districts."

[2] Less than 0.5 percent.

TABLE 9.—Liquefied petroleum gas and ethane produced at natural gas processing plants in 1962

(Thousand gallons)

States by petroleum districts	Propane	Butane-propane mix	Butane	Iso-butane	Other LP gas	Total
District 1:						
Western Pennsylvania	1,002	---	519	---	---	1,521
West Virginia	[1] 85,291	---	[1] 39,948	3,724	[2] 225,402	[1] 354,365
Total	86,293	---	40,467	3,724	225,402	355,886
District 2:						
Illinois	130,823	526	11,579	14,002	[2] 170,686	327,616
Kentucky	[3] 64,955	[3] 2,967	14,170	13,346	[2] [3] 156,908	[3] 252,346
Michigan	(3)	(3)	---	---	(3)	(3)
Kansas	74,687	6,254	65,063	20,765	---	166,769
Nebraska	18,585	---	10,133	---	---	28,718
North Dakota	43,499	103	25,279	---	---	68,881
Oklahoma	528,212	61,986	195,576	52,956	173	838,903
Total	860,761	71,836	321,800	101,069	327,767	1,683,233
District 3:						
Arkansas	38,591	14,908	6,717	9,236	---	69,452
Louisiana:						
Gulf	337,727	21,690	140,580	85,443	[2] 26,106	611,546
Inland	110,551	75,447	38,642	26,586	---	251,226
Total Louisiana	448,278	97,137	179,222	112,029	26,106	862,772
Mississippi	11,214	5,344	3,843	---	---	20,401
New Mexico	332,281	25,743	235,976	49,009	17,321	661,330
Texas:						
Gulf	202,767	44,520	184,966	203,084	[3] 364,736	1,000,073
West	1,097,408	142,663	568,813	87,385	82,425	1,978,694
East (Field)	51,311	8,217	44,838	5,884	12,134	122,384
Panhandle	299,391	29,421	212,783	139,156	19,527	700,278
Other	640,142	177,034	204,406	94,785	[2] 94,495	1,210,862
Total Texas	2,291,019	401,855	1,215,806	530,294	[2] 573,317	5,012,291
Total	3,122,383	544,987	1,641,564	700,568	616,744	6,626,246
District 4:						
Colorado	64,752	---	8,600	10,039	17,396	100,787
Montana	[4] 47,264	2,959	[4] 35,892	---	---	[4] 86,115
Utah	(4)	---	(4)	---	---	(4)
Wyoming	94,402	---	51,546	---	3,490	149,438
Total	206,418	2,959	96,038	10,039	20,886	336,340
District 5	277,331	19,213	41,312	29,675	39,847	407,378
Grand total	4,553,186	638,995	2,141,181	845,075	[5] 1,230,646	9,409,083

[1] Florida included with West Virginia.
[2] Includes ethane production.
[3] Michigan included with Kentucky.
[4] Utah included with Montana.
[5] Includes 552,456,000 gallons of ethane production.

TABLE 10.—Liquefied petroleum gas and ethane produced at refineries in 1962

(Thousand gallons)

States by petroleum districts	Propane	Butane-propane mix	Butane	Other LR gases	Total
District 1:					
East Coasts [1]	209,202		30,198	[2] 49,980	289,380
West New York	20,412	126		168	20,706
Pennsylvania	139,692		2,856		142,548
West Virginia				1,512	1,512
Total	369,306	126	33,054	51,660	454,146
District 2:					
Illinois	126,168		−2,436	2,688	126,420
Indiana	30,618	−798			29,820
Kansas	52,836	−42	28,812		81,606
Kentucky	28,434				28,434
Michigan	37,674	−126	−2,436	[2] 7,854	42,966
Minnesota	[3] 42,714	126	[3] 1,848	126	[3] 44,814
Missouri	(3)		(3)		(3)
North Dakota	(3)		(3)		(3)
Wisconsin	(3)				(3)
Ohio	120,582		2,016		122,598
Oklahoma	95,298	68,838	13,692	504	178,332
Total	534,324	67,998	41,496	11,172	654,990
District 3:					
Alabama		(4)			(4)
Arkansas	12,138	294	7,602	420	20,454
Louisiana:					
Gulf	146,790	19,068	56,952	[2] 335,748	558,558
Inland		3,318			3,318
Total Louisiana	146,790	22,386	56,952	[2] 335,748	561,876
Mississippi	8,862	[4] 966			[4] 9,828
New Mexico	4,410		7,098		11,508
Texas:					
Gulf	306,432	7,476	215,460	[2] 364,224	893,592
Inland	77,154	2,730	42,504	9,660	132,048
Total Texas	383,586	10,206	257,964	373,884	1,025,640
Total	555,786	33,852	329,616	710,052	1,629,306
District 4:					
Colorado	7,014		6,048		13,062
Montana	9,366		3,696		13,062
Utah	24,906		210	[2] 2,100	27,216
Wyoming	5,082		7,056	378	12,516
Total	46,368		17,010	2,478	65,856
District 5	292,278	5,040	74,550	[2] 50,526	422,394
Grand total	1,798,062	107,016	495,726	[5] 825,888	3,226,692

[1] Excludes Pennsylvania.
[2] Includes ethane production.
[3] Missouri, North Dakota, and Wisconsin included with Minnesota.
[4] Alabama included with Mississippi.
[5] Includes 415,422,000 gallons of ethane production.

PRICES

The average value for all natural gas liquids at plants in 1962 was 5.1 cents per gallon, the same as in 1961. The average value per gallon increased for all products except LP-gases and ethane; however, the increases only offset the 0.3-cent decline in these products which represent the major portion of plant output.

The average posted price for propane at New York Harbor in 1962, according to Platt's Oil Price Handbook, was 7.50 cents per gallon, 0.89 cents below the 1961 average.

STOCKS

Natural gas liquids stocks at plants and terminals declined 260.2 million gallons, and stocks at refineries increased 21.5 million gallons.

TABLE 11.—Stocks of natural gas liquids in the United States

(Thousand gallons)

Date	Natural gasoline and isopentane		LP gases and ethane		Other finished products and plant condensate		Total at plants and terminals	Total at refineries[1]	**Grand total**[1]
	At plants and terminals	At refineries[1]	At plants and terminals	At refineries[1]	At plants and terminals	At refineries			
Dec. 31:									
1958	156,788	41,496	634,885	29,820	80,289	12,306	871,962	83,622	**995,584**
1959	128,100	41,958	767,143	23,436	72,426	12,180	967,669	77,574	**1,045,243**
1960	143,295	54,264	920,340	26,418	64,543	5,922	1,128,178	86,604	**1,214,782**
1961	136,490	62,118	1,263,892	30,198	54,166	9,954	1,454,548	102,270	**1,556,818**
1962:									
Jan. 31	131,561	61,614	953,320	30,786	64,150	12,642	1,149,031	105,042	**1,254,073**
Feb. 28	141,490	70,644	942,788	29,190	65,594	11,088	1,149,872	110,922	**1,260,794**
Mar. 31	148,106	65,772	953,924	29,064	65,327	7,602	1,167,357	102,438	**1,269,795**
Apr. 30	146,502	64,470	1,059,239	28,812	62,829	16,464	1,268,570	109,746	**1,378,316**
May 31	147,160	63,336	1,158,100	26,334	61,286	27,468	1,366,546	117,138	**1,483,684**
June 30	147,907	75,264	1,235,969	24,654	59,656	24,108	1,443,532	124,026	**1,567,558**
July 31	160,180	74,550	1,310,829	22,848	55,864	17,640	1,526,873	115,038	**1,641,911**
Aug. 31	142,989	66,024	1,392,552	21,042	56,277	13,062	1,591,818	100,128	**1,691,946**
Sept. 30	129,131	63,840	1,401,768	25,998	55,036	20,748	1,585,935	110,586	**1,696,521**
Oct. 31	114,438	59,598	1,374,651	29,694	50,681	22,848	1,539,770	112,140	**1,651,910**
Nov. 30	116,561	57,372	1,249,536	39,312	53,895	23,772	1,419,992	120,456	**1,540,448**
Dec. 31	113,179	61,656	[2] 1,019,747	37,548	61,422	24,612	1,194,348	123,816	**1,318,164**

[1] Includes benzol from nonpetroleum sources prior to 1960.

[2] Includes 765 million gallons in underground storage.

STORAGE

Storage facilities for LP and LR gases increased 428 million gallons, or 14.9 percent, for the year ending September 30, 1962. Aboveground storage facilities declined 2 million gallons, and underground storage was increased by 430 million gallons. As of September 30, 1962, aboveground storage facilities for liquefied gases were filled to 90 percent of capacity, and underground facilities were filled to 46 percent of capacity.

TABLE 12.—Liquefied petroleum gas storage capacity and stock, Sept. 30, 1962

(Thousand gallons)

PAD district and State	Aboveground		Underground at plants, terminals, and refineries	Total	Stocks, Sept. 30, 1962
	At plants and terminals	At refineries			
District 1: East Coast and Appalachian No. 1 [1]	4,235	9,492	80,644	94,371	57,063
District 2:					
Indiana	(2)	(2)	(3)	----------	----------
Illinois	[2] 14,641	[2] 20,370	55,148	----------	----------
Kentucky	4,410	(4)	(2)	----------	----------
Ohio	----------	[4] 8,148	(3)	----------	----------
Michigan	508	882	[3] 127,473	----------	----------
Tennessee	----------	(4)	----------	----------	----------
Oklahoma	16,014	19,572	26,903	----------	----------
Kansas	6,016	[5] 8,106	305,165	----------	----------
Minnesota	(6)	3,108	13,650	----------	----------
Missouri, Nebraska, North Dakota, Iowa, Wisconsin	[6] 7,876	(5)	7,560	----------	----------
Total	49,465	60,186	535,899	645,550	404,504
District 3:					
Texas Inland:					
Panhandle	27,203	(7)	214,664	----------	----------
East	7,388	(7)	----------	----------	----------
West	26,635	[7] 8,442	343,457	----------	----------
Other	19,822	546	69,450	----------	----------
Texas Gulf	32,810	36,456	1,118,864	----------	----------
Louisiana Gulf and Alabama	10,538	[8] 12,474	268,943	----------	----------
Louisiana Inland	6,919	(8)	(9)	----------	----------
Arkansas	2,085	(8)	----------	----------	----------
Mississippi	727	----------	[9] 184,550	----------	----------
New Mexico	9,776	(7)	53,391	----------	----------
Total	143,903	57,918	2,253,319	2,455,140	1,128,455
District 4:					
Montana and Utah	832	[10] 1,260	11,500	----------	----------
Wyoming	2,740	2,772	----------	----------	----------
Colorado	4,497	(10)	----------	----------	----------
Total	8,069	4,032	11,500	23,601	16,768
District 5	4,530	34,440	41,000	79,970	61,720
Total United States	210,202	166,068	2,922,362	3,298,632	[11] 1,668,510

[1] Includes Pennsylvania, West Virginia, Delaware, New Jersey, and New York.

[2] Indiana included with Illinois.

[3] Kentucky, Indiana, and Ohio included with Michigan.

[4] Kentucky and Tennessee included with Ohio.

[5] Missouri, North Dakota, and Wisconsin included with Kansas.

[6] Minnesota included in Missouri, Nebraska, North Dakota, etc.

[7] Panhandle, East Texas, and New Mexico included with West Texas.

[8] Louisiana Inland and Arkansas included with Louisiana Gulf and Alabama.

[9] Louisiana Inland included with Mississippi.

[10] Colorado included with Montana and Utah.

[11] Includes 1,096 million gallons in underground storage at plants and terminals and 235 million gallons in underground storage at petroleum refineries.

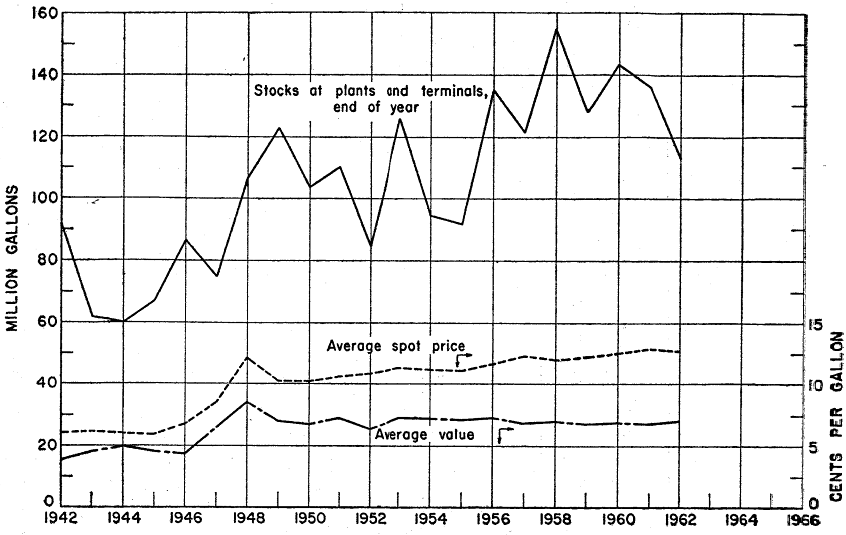


FIGURE 2.—Stock of natural gasoline, average value of natural gasoline, and spot price of regular 91 octane motor gasoline at Oklahoma refineries.

SHIPMENTS OF LIQUEFIED PETROLEUM GASES[5] AND ETHANE

Shipments of LP gases for domestic use, excluding LP gases used in the production of gasoline, increased 9 percent, compared with a 3-percent increase in 1961. Percent changes from 1961 in the various categories were as follows:

Category:	*Percent change*
Domestic and commercial	+9
Internal combustion	+6
Industrial use	+6
Refinery fuel use	+39
Gas manufacture	+3
Chemical manufacture	+10
Synthetic rubber manufacture	+13
Secondary recovery	−19
All other uses	+10

The survey covering shipments of LP gases in the West Coast marketing area (PAD district 5) was made by Frank A. Moore, Division of Mineral Resources, Bureau of Mines, San Francisco, Calif.

---

[5] Data included LR gases but exclude LP gases blended into gasoline.

TABLE 13.—Shipments of LP gases [1] and ethane in the United States, by types

(Thousand gallons)

Year	Ethane		Propane		Butane		Isobutane		Butane-propane mixtures		All other mixtures		Total LP gas and ethane	
	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Percent of total	Quantity	Total percent
1958	(2)	----------	4,247,373	56.9	1,119,544	15.0	25,805	0.3	1,050,086	14.1	1,019,281	13.7	7,462,089	100.0
1959	783,789	8.8	5,132,194	57.5	1,298,487	14.6	11,086	.1	1,143,284	12.8	550,321	6.2	8,919,161	100.0
1960	965,175	10.1	5,743,694	60.2	1,099,544	11.5	15,959	.1	1,093,511	11.5	626,766	6.6	9,544,649	100.0
1961	1,075,957	11.0	5,935,967	60.6	1,065,513	10.9	62,279	.6	1,107,329	11.3	550,838	5.6	9,797,883	100.0
1962	1,233,423	11.5	6,463,750	60.2	1,443,081	13.5	41,282	.4	1,074,988	10.0	472,870	4.4	10,729,394	100.0

[1] Data include LR gases but exclude LP gases blended into gasoline.
[2] Not reported separately before 1959.

TABLE 14.—Shipments of LP gases[1] and ethane in the United States, by uses

(Thousand gallons)

Year	Domestic and commercial	Internal combustion	Industrial	Refinery fuel	Gas manufacturing	Chemical	Synthetic rubber	Used in the secondary recovery of petroleum	All other	Total
1958	3,293,677	852,387	492,862	179,231	238,911	1,898,862	371,961	68,981	65,217	7,462,089
1959	3,934,792	889,698	439,200	136,830	182,903	2,525,910	513,941	231,134	64,753	8,919,161
1960	4,224,537	897,915	438,659	157,036	157,041	3,019,011	538,971	53,240	58,239	9,544,649
1961	4,318,215	880,315	402,428	166,572	168,989	3,239,479	519,637	51,683	50,565	9,797,883
1962	4,712,682	931,611	424,730	231,084	173,481	3,571,339	587,379	41,676	55,412	10,729,394

[1] Data include LR gases but exclude LP gases blended into gasoline.

TABLE 15.—Shipments of LP gases[1] and ethane in the United States, by PAD districts, States, and uses

(Thousand gallons)

District and State	Domestic and commercial		Internal combustion		Industrial		Refinery fuel		Gas manufacturing	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
District 1:										
Connecticut	30,495	34,815	655	649	9,376	10,040	(2)	(2)	2,424	2,716
Delaware	10,769	11,590	157	199	2,452	2,801			242	763
Florida	170,642	185,241	16,982	21,854	6,689	6,598			12,316	12,415
Georgia	114,491	123,883	13,873	18,305	5,455	6,668			9,108	16,950
Maine	18,642	21,117	150	119	986	1,056			9	-----
Maryland and D.C	33,373	39,961	1,829	2,150	4,135	4,367			3,877	4,178
Massachusetts	32,927	39,769	653	792	4,486	4,500			7,103	7,563
New Hampshire	18,054	20,794	20	109	1,183	1,433			1,257	1,380
New Jersey	32,690	36,718	1,252	2,640	16,730	19,197			2,557	1,690
New York	103,891	108,492	3,918	4,964	8,526	9,551			1,580	702
North Carolina	79,182	93,958	1,179	1,717	8,296	8,024			538	1,016
Pennsylvania	56,761	62,136	3,541	5,208	27,091	27,840			4,993	2,468
Rhode Island	7,367	9,469	306	397	826	1,132			281	449
South Carolina	43,378	52,387	2,546	2,869	6,007	7,567			1,058	1,107
Vermont	13,139	12,428	25	35	899	1,562			3,812	3,612
Virginia	39,208	42,410	1,641	2,127	4,473	6,262			5,579	3,368
West Virginia	14,527	23,145	274	1,392	825	1,674			127	177
Total	819,536	918,313	49,001	65,526	108,435	120,272	18,480	16,128	56,861	60,554
District 2:										
Illinois	244,599	267,316	54,396	57,093	38,004	42,030	(2)	(2)	7,410	7,867
Indiana	164,657	182,474	8,579	9,765	42,717	45,375			4,832	4,379
Iowa	162,537	191,928	2,935	4,358	4,555	7,629			1,023	1,652
Kansas	180,773	195,875	36,605	44,379	5,262	3,739			-----	177
Kentucky	64,671	70,849	5,612	5,979	1,696	2,284			5,730	6,247
Michgian	93,155	100,923	3,936	4,592	10,821	13,380			1,743	2,462
Minnesota	155,053	163,550	4,430	5,962	21,254	20,707			5,952	3,570
Missouri	249,720	272,990	7,205	9,346	6,663	7,512			4,686	2,968
Nebraska	95,842	107,159	15,555	14,314	1,353	1,310			987	859
North Dakota	39,248	40,572	4,897	6,461	4,392	4,288			3,612	1,659
Ohio	92,558	104,969	6,162	8,704	10,774	15,370			13,314	18,571
Oklahoma	200,579	227,756	59,352	61,137	10,502	9,290			-----	7
South Dakota	53,887	58,004	4,118	3,951	1,467	698			-----	212
Tennessee	44,033	48,306	3,693	4,784	4,996	5,407			1,983	2,552
Wisconsin	133,313	160,092	4,602	5,191	31,097	25,245			6,202	3,078
Total	1,974,625	2,192,763	222,077	246,016	195,553	204,264	96,096	114,996	57,474	56,260

District 3:										
Alabama	111,938	116,008	4,929	8,004	3,059	4,646	(2)	(2)	-----------	3,024
Arkansas	149,504	156,009	60,482	60,446	4,032	3,138			39	-----------
Louisiana	86,498	93,282	48,527	48,406	14,974	11,055			-----------	-----------
Mississippi	127,597	136,894	41,218	46,000	1,819	1,390			10	63
New Mexico	84,818	76,426	23,947	23,044	648	1,631			2,376	250
Texas	499,320	503,303	356,808	356,972	31,486	26,700			834	747
Total	1,059,675	1,081,922	535,911	542,872	56,018	48,560	12,894	51,576	3,259	4,084
District 4:										
Colorado	102,753	102,980	10,115	10,171	3,115	3,479	(2)	(2)	2,037	2,092
Idaho	15,792	15,899	1,510	1,912	3,773	3,945			-----------	-----------
Montana	30,429	27,687	4,975	5,538	452	1,130			-----------	-----------
Utah	16,220	15,131	5,540	5,459	755	827			-----------	-----------
Wyoming	29,012	27,312	12,361	12,949	2,697	2,872			-----------	-----------
Total	194,206	189,009	34,501	36,029	10,792	12,253	11,634	14,952	2,037	2,092
District 5:										
Alaska	3,296	2,279	-----------	2	-----------	65	(2)	(2)	97	-----------
Arizona	25,865	35,464	5,315	4,677	211	398			23	-----------
California	188,970	215,826	29,160	33,307	25,183	29,843			20,918	25,131
Hawaii	3,720	4,973	375	-----------	76	-----------			1,687	2,242
Nevada	16,964	19,389	1,453	479	208	163			19,027	14,654
Oregon	12,531	17,919	1,532	1,281	4,018	6,314			7,606	8,252
Washington	18,827	34,825	990	1,422	1,934	2,598			-----------	212
Total	270,173	330,675	38,825	41,168	31,630	39,381	27,468	33,432	49,358	50,491
Total U.S. shipments	4,318,215	4,712,682	880,315	931,611	402,428	424,730	166,572	231,084	168,989	173,481

See footnotes at end of table.

TABLE 15.—Shipments of LP gases [1] and ethane in the United States, by PAD districts, States, and uses—Continued

(Thousand gallons)

District and State	Chemical		Synthetic rubber		Use in the secondary recovery of petroleum		All other		Total	
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962
District 1:										
Connecticut	(2)	(2)	----------	----------	----------	----------	1,206	1,547	44,156	49,767
Delaware							43	11	13,663	15,364
Florida							684	900	207,313	227,008
Georgia							3,077	3,876	146,004	169,682
Maine							52	52	19,839	22,344
Maryland							50	76	43,264	50,732
Massachusetts							337	211	45,506	52,835
New Hampshire							31	23	20,545	23,739
New Jersey							13	22	53,242	60,267
New York							93	110	118,008	123,819
North Carolina							7,468	11,372	96,663	116,087
Pennsylvania							145	60	92,531	97,712
Rhode Island							----------	----------	8,780	11,447
South Carolina							1,611	2,396	54,600	66,326
Vermont							----------	21	17,875	17,658
Virginia							444	649	51,345	54,816
West Virginia							----------	----------	15,753	26,388
Total	440,706	472,769	----------	----------	----------	----------	15,254	21,326	[3] 1,508,273	[3] 1,674,888
District 2:										
Illinois	(2)	(2)	----------	----------	(2)	(2)	2,387	1,577	346,796	375,883
Indiana							1,044	1,227	221,829	243,220
Iowa							1,607	1,591	172,657	207,158
Kansas							1,018	865	223,658	245,035
Kentucky							72	407	77,781	85,766
Michigan							407	445	110,062	121,802
Minnesota							1,020	1,324	187,709	195,113
Missouri							396	549	268,670	293,365
Nebraska							631	391	114,368	124,033
North Dakota							788	780	52,937	53,760
Ohio							644	1,385	123,452	148,999
Oklahoma							1,059	659	271,492	298,849
South Dakota							106	217	59,578	63,082
Tennessee							339	54	55,044	61,103
Wisconsin							600	700	175,814	194,306
Total	324,485	350,398	----------	----------	994	3,422	12,118	12,171	[3] 2,883,422	[3] 3,180,290

District 3:										
Alabama	[2]	[2]	[2]	[2]	[2]	[2]	150	---	120,076	131,682
Arkansas							1,871	1,996	215,928	221,589
Louisiana							1,468	704	151,467	153,447
Mississippi							1,375	2,446	172,019	186,793
New Mexico							700	814	112,489	102,165
Texas							8,913	8,660	897,361	896,382
Total	2,344,406	2,648,181	501,931	562,315	6,004	1,016	14,477	14,620	[3] 4,534,575	[3] 4,955,146
District 4:										
Colorado	---	---	---	---	[2]	[2]	1,003	1,015	119,023	119,737
Idaho							50	323	21,125	22,079
Montana							112	55	35,968	34,410
Utah							---	48	22,515	21,465
Wyoming							28	27	44,098	43,160
Total	---	---	---	---	3,861	8,483	1,193	1,468	[3] 258,224	[3] 264,286
District 5:										
Alaska	[2]	[2]	[2]	[2]	[2]	[2]	---	---	3,393	2,346
Arizona							261	574	31,675	41,113
California							7,168	5,235	271,399	309,342
Hawaii							---	---	5,858	7,215
Nevada							---	18	37,652	34,703
Oregon							94	---	25,781	33,766
Washington							---	---	21,751	39,057
Total	129,882	99,991	17,706	25,064	40,824	28,755	7,523	5,827	[3] 613,389	[3] 654,784
Total U.S. shipments	3,239,479	3,571,339	519,637	587,379	51,683	41,676	50,565	55,412	9,797,883	10,729,394

---

[1] Data include LR gases but exclude LP gases blended into gasoline.

[2] Individual States not shown to avoid disclosing individual company data.

[3] Refinery fuel use, chemical use, synthetic rubber use, and use for secondary recovery included in district totals only.

TABLE 16.—Shipments of LP gases [1] and ethane in the United States, by PAD districts and States

(Thousand gallons)

District and State	Ethane		Propane		Butane		Isobutane		Butane-propane mixtures		All other mixtures		Total LP gases and ethane		
	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	1961	1962	Percent change
District 1:															
Connecticut	(2)	(2)	44,112	49,715	10	32	(2)	(2)	34	20	(2)	(2)	44,156	49,767	12.7
Delaware			13,624	15,325	------	------			39	39			13,663	15,364	12.4
Florida			166,048	187,791	1,707	1,752			39,558	37,465			207,313	227,008	9.5
Georgia			110,545	133,853	3,399	3,317			32,060	32,512			146,004	169,682	16.2
Maine			19,839	22,344	------	------			------	------			19,839	22,344	12.6
Maryland and D.C			43,030	50,205	------	160			234	367			43,264	50,732	17.3
Massachusetts			44,219	52,835	1,287	------			------	------			45,506	52,835	16.1
New Hampshire			20,135	23,322	410	417			------	------			20,545	23,739	15.5
New Jersey			53,242	59,985	------	------			------	282			53,242	60,267	13.2
New York			115,747	122,195	17	20			2,244	1,604			118,008	123,819	4.9
North Carolina			94,271	113,459	54	36			2,338	2,592			96,663	116,087	20.1
Pennsylvania			81,889	90,629	7,026	3,349			3,616	3,734			92,531	97,712	5.6
Rhode Island			8,780	11,447	------	------			------	------			8,780	11,447	30.4
South Carolina			43,140	57,370	80	167			11,380	8,789			54,600	66,326	21.5
Vermont			17,875	17,658	------	------			------	------			17,875	17,658	—1.2
Virginia			50,920	54,518	425	298			------	------			51,345	54,816	6.8
West Virginia			15,016	26,344	712	------			25	44			15,753	26,388	67.5
Total	[3] 346,822	[3] 340,726	[3] 978,497	[3] 1,153,506	[3] 72,563	[3] 74,947	[3] 364	[3] 590	[3] 93,995	[3] 88,635	[3] 16,032	[3] 16,484	[3] 1,508,273	[3] 1,674,888	11.0
District 2:															
Illinois	(2)	(2)	337,566	366,365	6,371	7,646	(2)	(2)	2,859	1,872	(2)	(2)	346,796	375,883	8.4
Indiana			217,084	240,507	4,012	1,844			733	869			221,829	243,220	9.6
Iowa			171,782	206,970	760	119			115	69			172,657	207,158	20.0
Kansas			187,906	211,185	16,070	15,641			19,682	18,209			223,658	245,035	9.6
Kentucky			75,441	83,538	285	157			2,055	2,071			77,781	85,766	10.3
Michigan			109,962	121,506	100	272			------	24			110,062	121,802	10.7
Minnesota			182,371	189,197	5,128	5,583			210	333			187,709	195,113	3.9
Missouri			255,654	284,847	4,074	3,298			8,942	5,220			268,670	293,365	9.2
Nebraska			111,433	122,054	1,712	1,041			1,223	938			114,368	124,033	8.5
North Dakota			47,065	48,741	4,245	2,808			1,627	2,211			52,937	53,760	1.6
Ohio			123,226	148,497	191	502			35	------			123,452	148,999	20.7
Oklahoma			197,413	219,880	25,318	22,387			48,761	56,582			271,492	298,849	10.1
South Dakota			58,194	61,986	482	10			902	1,086			59,578	63,082	5.9
Tennessee			49,527	56,014	1,291	426			4,226	4,663			55,044	61,103	11.0
Wisconsin			161,519	185,944	12,346	8,026			1,949	336			175,814	194,306	10.5
Total	[3] 225,494	[3] 237,846	[3] 2,341,334	[3] 2,649,546	[3] 188,170	[3] 172,651	[3] 5,782	[3] 5,362	[3] 105,792	[3] 103,983	[3] 16,850	[3] 10,902	[3] 2,883,422	[3] 3,180,290	10.3

District 3:														
Alabama	(2)	(2)	86, 831	97, 928	3, 631	3, 382	(2)	(2)	29, 614	30, 372	(2)	(2)	120, 076	131, 682	9. 7
Arkansas			156, 013	159, 614	10, 799	8, 466			49, 116	53, 509			215, 928	221, 589	2. 6
Louisiana			64, 534	62, 401	10, 343	10, 610			76, 590	80, 436			151, 467	153, 447	1. 3
Mississippi			93, 481	106, 697	8, 551	7, 510			69, 987	72, 586			172, 019	186, 793	8. 6
New Mexico			96, 624	85, 088	2, 641	3, 572			13, 224	13, 505			112, 489	102, 165	-9. 2
Texas			375, 663	369, 788	65, 244	60, 706			456, 454	465, 888			897, 361	896, 382	—. 1
Total	[3] 495, 661	[3] 633, 031	[3] 1, 925, 421	[3] 1, 933, 377	[3] 768, 103	[3] 1, 152, 173	[3] 56, 133	[3] 35, 330	[3] 845, 620	[3] 798, 647	[3] 443, 637	[3] 402, 588	[3] 4, 534, 575	[3] 4, 955, 146	9. 3
District 4:															
Colorado	--------	--------	113, 863	114, 825	1, 405	1, 407	--------	--------	3, 755	3, 505	--------	--------	119, 023	119, 737	. 6
Idaho	--------	--------	21, 125	22, 079	--------	--------	--------	--------	--------	--------	--------	--------	21, 125	22, 079	4. 5
Montana	--------	--------	33, 233	31, 862	1, 367	1, 043	--------	--------	1, 368	1, 505	--------	--------	35, 968	34, 410	—4. 3
Utah	--------	--------	21, 627	20, 639	4	35	--------	--------	884	791	--------	--------	22, 515	21, 465	—4. 7
Wyoming	--------	--------	35, 828	35, 777	595	231	--------	--------	7, 675	7, 152	--------	--------	44, 098	43, 160	—2. 1
Total	--------	--------	[3] 229, 662	[3] 237, 625	[3] 11, 580	[3] 10, 748	--------	--------	[3] 16, 982	[3] 15, 913	--------	--------	[3] 258, 224	[3] 264, 286	2. 3
District 5:															
Alaska	(2)	(2)	3, 393	2, 346	(2)	(2)	--------	--------	--------	--------	--------	--------	3, 393	2, 346	—30. 9
Arizona			29, 481	35, 057					2, 194	6, 056	--------	--------	31, 675	41, 113	29. 8
California			235, 040	255, 661					36, 359	53, 681	--------	--------	271, 399	309, 342	14. 0
Hawaii			93	22					5, 765	7, 193	--------	--------	5, 858	7, 215	23. 2
Nevada			37, 584	34, 634					68	69	--------	--------	37, 652	34, 703	—7. 8
Oregon			25, 781	33, 766					--------	--------	--------	--------	25, 781	33, 766	31. 0
Washington			21, 364	38, 660					554	397	--------	--------	21, 918	39, 057	78. 2
Total	[3] 7, 980	[3] 21, 820	[3] 461, 053	[3] 489, 696	[3] 25, 097	[3] 32, 562	--------	--------	[3] 44, 940	[3] 67, 810	[3] 74, 319	[3] 42, 896	[3] 613, 389	[3] 654, 784	6. 7
Total United States shipments	1, 075, 957	1, 233, 423	5, 935, 967	6, 463, 750	1, 065, 513	1, 443, 081	62, 279	41, 282	1, 107, 329	1, 074, 988	550, 838	472, 870	9, 797, 883	10, 729, 394	9. 5

---

[1] Data include LR gases but exclude LP gases blended into gasoline.

[2] Individual States not shown to avoid disclosing individual company data.

[3] Refinery fuel use, chemical, synthetic rubber and use for secondary recovery included in district totals only.

FOREIGN TRADE

The imports and exports statistics included in this section were compiled by the U.S. Department of Commerce and differ slightly from those used in other sections of this chapter. The Bureau of Mines import data exclude all imports from foreign sources to U.S. territories and possessions from the United States.

Exports of liquefied gases totaled 163 million gallons, 92 percent of which was destined for Mexico. Total exports of natural gasoline were 364,000 gallons.

Imports of liquefied gases increased from 76 million gallons in 1961 to 95 million in 1962. Canada was the origin of 88 percent of the 1962 imports.

TABLE 17.—LP gases[1] exported from the United States, by countries

(Thousand gallons[2])

Country	1953-57 (average)	1958[3]	1959[3]	1960[3]	1961[3]	1962[3]
North America:						
Canada	56,572	15,497	3,768	5,251	4,134	3,657
Cuba	7,108	4,032	3,727	1,211	---	---
Mexico	80,780	88,996	84,965	111,858	121,890	148,931
Netherlands Antilles	1,346	---	---	---	2	8
Other North America:						
Bermuda and Caribbean	2,027	1,280	1,118	2,580	3,364	2,023
Central America	1,629	1,063	278	456	489	628
Greenland	6	---	---	---	---	---
Total	149,468	110,868	93,856	121,356	129,879	155,247
South America:						
Argentina	230	---	72	3,818	14,514	3,518
Brazil	16,147	8,756	---	---	454	18
Other South America	269	25	95	32	34	223
Total	16,646	8,781	167	3,850	15,002	3,759
Europe:						
Denmark	128	---	---	---	24	22
France	37	(4)	---	(4)	149	113
Germany, West	69	(4)	132	(4)	528	1,353
Italy	199	---	15	21	399	489
Netherlands	8	---	2	---	133	132
Sweden	30	---	---	19	(4)	10
United Kingdom	43	11	(4)	15	1,566	354
Other Europe	22	---	3	---	46	106
Total	536	11	152	55	2,845	2,579
Asia:						
Israel	15	---	50	---	9	15
Japan	244	12	164	23	673	374
Philippines	194	---	---	---	---	---
Other Asia	21	4	---	2	22	8
Total	474	16	214	25	704	397
Africa	167	10	---	6	212	325
Oceania	84	183	140	245	410	428
Grand total	167,375	119,869	94,529	125,537	149,052	162,735

---

[1] Data include LR gases.
[2] 4.5 pounds=1 gallon.
[3] Because of changes in classification, data not strictly comparable with earlier years.
[4] Less than 1,000 gallons.

Source: Bureau of the Census.

TABLE 18.—Natural gasoline exported from the United States, by countries

(Thousand gallons)

Country	1953–57 (average)	1958	1959	1960	1961	1962
Canada	14,934	133	67	15	61	239
Mexico	26	8	24	38	40	35
Netherlands Antilles	1,121					
Turkey					24	
United Kingdom					140	
Other countries	7	7			80	90
Total	16,088	148	91	53	345	364

Source: Bureau of the Census.

Crude Petroleum and Petroleum Products

By James G. Kirby,[1] Walter G. Messner,[2] and Betty M. Moore[3]

Contents

	Page
General summary	373
Demand by products	374
Scope of report	375
Districts	379
World oil supply	382
Reserves	382
Crude petroleum	383
Supply and demand	383
Production	385
General	385
By States	385
Wells	400
Consumption and distribution	403
Stocks	416
Tank storage capacities	421
Value and price	426
Refined products	428
General review	428
Refinery capacity	438
Refined products—Continued	
Aviation gasoline	438
Gasoline	438
Kerosine	457
Distillate fuel oil	461
Residual fuel oil	466
Lubricants	472
Jet fuel (military grade)	474
Liquified gases (including ethane)	476
Asphalt and road oil	478
Other products	487
Intercoastal shipments	493
Foreign trade	495
World supply and demand	504
Petroleum	504
Native asphalt	516
Bituminous Limestone and Sandstone	516
Gilsonite	516

GENERAL SUMMARY

STIMULATED by a sharp increase in general business activity and by weather which was more than 5 percent colder than normal during the first and fourth quarters, total demand[4] for petroleum in 1962 increased 4.2 percent to 10,396,000 barrels daily. Exports continued to decline and were 3.4 percent less than a year ago. Domestic demand was 10,228,000 barrels daily, a 4.3 percent increase for the year. The total new supply of all oils in 1963 was 10,428,000 barrels daily, of which domestic crude oil production, 7,332,000 barrels, represented 70.3 percent; natural gas liquids production, 1,017,000 barrels, represented 9.8 percent; and imports of crude oil and refined products, 2,079,000 barrels, represented 19.9 percent.

---

[1] Chief, Section of Economic Analysis and Forecast.

[2] Mineral specialist.

[3] Statistical assistant.

[4] Certain terms as used in this chapter are more or less unique to the petroleum industry. Principal terms and their meaning are:

Total demand.—A derived figure representing total new supply plus decreases or minus increases in reported stocks. Because there are substantial secondary and consumers' stocks that are not reported to the Bureau of Mines, this figure varies considerably from consumption.

Domestic demand.—Total demand less exports.

New supply of all oils.—The sum of crude oil production plus production of natural-gas liquids, plus benzol (coke-oven) used for motor fuel, plus imports of crude oil and other petroleum products.

Transfers.—Crude oil conveyed to fuel-oil stocks without processing, or reclassification of products from one product category to another.

All oils.—Crude petroleum, natural-gas liquids, and their derivatives.

Principal product.—Gasoline, kerosine, distillate fuel, and residual fuel oil.

TABLE 1.—Salient statistics of crude petroleum, refined products, and natural-gas liquids in the United States[1]

	1958	1959	1960	1961	1962[2]
Crude petroleum:					
Domestic production....thousand barrels[3]	2,448,987	2,574,590	2,574,933	2,621,758	2,676,185
World production....do	6,607,750	7,133,408	7,674,493	8,186,246	8,878,881
U.S. proportion....percent	37	36	34	32	30
Imports[4]....thousand barrels[3]	348,007	352,344	371,575	381,548	411,039
Exports[5]....do	4,346	2,526	3,087	3,227	1,786
Stocks, end of year....do	262,730	257,129	239,800	244,664	252,011
Runs to stills....do	2,789,404	2,917,661	2,952,534	2,987,158	3,069,631
Value of domestic production at wells:					
Total....thousand dollars	7,379,973	7,473,336	7,420,181	7,565,582	7,768,822
Average per barrel	$3.01	$2.90	$2.88	$2.89	$2.90
Total producing oil wells Dec. 31	574,903	583,141	591,158	594,917	596,385
Total oil wells completed during year (successful wells)	25,262	27,055	22,492	21,850	21,372
Refined products:					
Imports[6]....thousand barrels[3]	272,582	297,239	292,536	318,118	347,953
Exports[5]....do	96,292	74,541	70,819	60,336	59,511
Stocks, end of year....do	503,314	526,954	515,827	543,343	553,473
Output of gasoline....do	1,439,511	1,488,860	1,522,497	[7]1,534,462	[7]1,581,859
Yield of gasoline....percent	45.2	44.9	45.1	44.7	44.8
Average dealers' net price (excluding tax) of gasoline in 55 U.S. cities....cents per gallon[8]	16.22	16.09	16.08	15.80	15.45
Completed refineries, end of year	313	310	311	311	308
Daily crude-oil capacity....thousand barrels[3]	9,820	9,901	10,010	10,105	10,106
Natural-gas liquids:					
Production....do	294,749	320,757	340,157	361,689	370,989
Stocks, end of year....do	22,752	24,887	28,931	37,067	31,385

[1] Data include imports to and exports from the United States.
[2] Preliminary figures.
[3] 42 gallons per barrel.
[4] Bureau of Mines data for crude oil and unfinished oils.
[5] U.S. Department of Commerce data, except those for Alaska (before 1959) and Hawaii (before 1960) which are Bureau of Mines data. Exports include shipments to territories.
[6] U.S. Department of Commerce data, except for unfinished oils.
[7] Excludes unfinished gasoline, which is considered as unfinished oils.
[8] Platt's Oil Price Handbook.

DEMAND BY PRODUCTS

As most of the indicated consumption of crude oil in the United States is converted into products at refineries, before sale to ultimate consumers, the analysis of demand trends of each major product must be considered. The fuel oils (residual, distillate, and kerosine) compete directly with natural gas or coal in heating, cooking, and industrial uses. Gasoline and diesel fuel are the major fuels used in the transportation field, followed by jet fuel (a blend of low-grade gasoline, kerosine, and distillate) used in miltary jetplanes and straight kerosine which is used as fuel by commercial jetplanes. The other products serve a wide variety of uses in competition with other products as fuel and in special uses that are not fuels.

Gasoline.—The total demand for gasoline in 1962 was 1,589,858 thousand barrels, including a domestic demand of 1,583,404 thousand barrels and exports of 6,454 thousand barrels. Total demand increased 3.1 percent, domestic demand increased 3.3 percent, and exports declined 28.1 percent for the year. The demand for aviation-grade gasolines declined 6.0 million barrels in 1962. A breakdown of domestic demand by uses indicates that civilian highways consumed 88.3 percent, aviation gasoline consumed 3.3 percent, and nonhighway vehicles, nonfuel use, and losses, consumed 8.4 percent. Aviation gasoline and naphtha are included in the total demand for gasoline.

Distillate Fuel Oil.—The 5.5 percent increase in the domestic demand for distillate fuel oil in 1962 reflects the colder than normal weather during the first and fourth quarters of the year. In the first quarter domestic demand increased 9.2 percent, and in the fourth quarter it increased 6.5 percent. Total demand for the year was 740.3 million barrels, which included exports of 8.2 million and a domestic demand of 732.1 million barrels.

Residual Fuel Oil.—The demand for residual fuel oil in 1962 was 558.3 million barrels, a decrease of 4.5 million from the previous year. Exports declined 1.2 million barrels, and domestic use 3.3 million barrels. Like distillate fuel oil, residual fuel oil demand reacts to weather. First and fourth quarter demands were about 4 percent more than a year ago, but not high enough to offset heavy declines in the second and third quarters. Use of residual fuel oil in the Atlantic coastal States increased 48,000 barrels daily in 1962, but daily demand in the Midwestern and Gulf Coast States decreased 25,000 barrels and in the Pacific Coast States 35,000 barrels.

Kerosine.—The total demand for kerosine increased 13.6 percent to 164.4 million barrels in 1962. Sales of kerosine for use as commercial jet-aircraft fuel were 39.2 percent higher than the previous year, totaling 65.7 million barrels. Jet fuel represented 40.1 percent of the total demand for kerosine, compared with 32.7 percent in 1961.

Other Products.—The total demand for all other products, including crude-oil exports and losses and refinery overage was 741.7 million barrels in 1962, a gain of 7.2 percent for the year. Excluding crude oil and the refinery overage, the total demand for the other products was 800.0 million barrels, a 6.6 percent increase over that of 1961. The domestic demand for other products totaled 708.2 million barrels in 1962. This includes refinery overage of 63.9 million barrels and a crude loss of 3.5 million and represents a 7.5-percent gain for the year. Exports for the refined products included in this group increased 4.9 percent in 1962, but crude-oil exports declined 44.7 percent for the year. The percentage changes (increases or decreases) for 1962 in domestic demand for the individual products in this group are as follows: Road oil, +20.0 percent; miscellaneous oils, +10.5 percent; liquefied gases, +9.0 percent; military-jet fuel, +7.6 percent; asphalt, +5.9 percent; coke, +5.3 percent; lubricating oils, +5.0 percent; still gas, +2.6 percent; and wax, −9.7 percent.

Shipments to U.S. Territories and Possessions.—Domestic demand, as defined in this chapter, refers to demand in all States of the United States. Beginning with 1959, Alaskan demand for petroleum is included with the figures for States, and Hawaiian demand is included with the 1960 data. Shipments from the United States to Territories and possessions are included with exports. Any foreign receipts into these Territories and possessions are not included in the total imports shown.

Shipments from Territories and possessions to foreign countries are excluded from total exports. Shipments to the United States are included in imports.

SCOPE OF REPORT

This report deals primarily with statistics for production, refining, distribution, and indicated consumption of crude petroleum and

TABLE 2.—Supply and demand of all oils in the United States, 1960 total and 1961–62, by months

(Thousand barrels)

	1961													1960 total
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
New supply:														
Domestic production:														
Crude petroleum	223, 497	204, 274	231, 596	219, 846	221, 553	213, 084	215, 699	220, 218	209, 848	220, 942	214, 566	226, 635	2, 621, 758	2, 574, 933
Natural-gas liquids	31, 174	28, 427	31, 108	30, 261	29, 856	28, 925	29, 551	29, 807	28, 188	30, 605	31, 197	32, 590	361, 689	340, 157
Benzol, etc	14	15	13	13	18	12	17	11	13	15	15	13	169	275
Total production	254, 685	232, 716	262, 717	250, 120	251, 427	242, 021	245, 267	250, 036	238, 049	251, 562	245, 778	259, 238	2, 983, 616	2, 915, 365
Imports: [1]														
Crude petroleum	33, 688	28, 768	33, 276	26, 969	33, 566	27, 186	37, 975	34, 048	33, 147	33, 585	30, 119	29, 221	381, 548	371, 575
Refined products	33, 764	30, 759	29, 160	28, 893	24, 935	19, 999	25, 523	19, 838	22, 752	23, 475	27, 230	31, 790	318, 118	292, 536
Total new supply	322, 137	292, 243	325, 153	305, 982	309, 928	289, 206	308, 765	303, 922	293, 948	308, 622	303. 127	320, 249	3, 683, 282	3, 579, 476
Increase (+) or decrease (−) in stocks	−25, 119	−7, 223	+14, 783	+24, 135	+16, 066	+9, 802	+21, 230	+3, 339	+12, 047	+12, 583	−12, 857	−28, 270	+40, 516	−30, 235
Demand:														
Total demand	347. 256	299, 466	310, 370	281, 847	293, 862	279, 404	287, 535	300, 583	281, 901	296, 039	315, 984	348. 519	3, 642, 766	3, 609, 711
Exports: [2]														
Crude petroleum	135	295	339	316	229	435	178	309	130	190	400	271	3, 227	3, 087
Refined products	5, 066	4, 203	5, 245	5, 298	5, 643	5, 399	4. 770	5, 483	4, 434	5, 147	4, 977	4, 671	60, 336	70, 819
Domestic demand:														
Gasoline	114, 673	105, 593	126, 572	119, 197	137, 283	138, 467	137, 517	140, 416	130, 210	128, 871	128, 465	125, 909	1, 533, 173	1, 511, 670
Kerosine	18, 130	15, 175	11, 740	9, 101	9, 263	7, 879	9, 361	10, 233	9, 699	12, 171	13, 856	17, 827	144, 435	132, 499
Distillate fuel oil	96, 454	74, 919	66, 467	53, 526	44, 331	37, 132	39, 270	40, 918	41, 288	48, 061	64, 202	87, 788	694, 356	685, 268
Residual fuel oil	59, 020	53, 836	51, 987	46, 774	40, 480	32, 429	40, 205	39, 290	37, 249	42, 942	48, 882	55, 584	548, 678	559, 439
Military jet fuel	7, 836	7, 113	8, 761	8, 138	10, 631	8, 536	7, 968	9, 735	10, 233	8, 447	8, 400	8, 638	104, 436	102, 803
Lubricants	3, 596	2, 754	3, 528	3, 007	4, 042	3, 582	3, 474	3, 748	3, 445	3, 802	3, 454	3, 102	41, 534	42, 676
Miscellaneous	42, 346	35, 578	35, 731	36, 490	41, 960	45, 545	44, 792	50, 451	45, 213	46, 408	43, 348	44, 729	512, 591	501, 450
Total domestic demand	342, 055	294, 968	304, 786	276, 233	287, 990	273, 570	282, 587	294, 791	277, 337	290, 702	310, 607	343, 577	3, 579, 203	3, 535, 805
Stocks:														
Crude petroleum	236, 769	232, 063	244, 921	256, 145	261, 440	261, 056	256, 953	248, 125	251, 032	251, 139	248, 681	244, 664	244, 664	239, 800
Natural-gas liquids	23, 982	23, 195	27, 548	31, 579	35, 399	38, 188	41, 422	42, 782	44, 405	44, 150	41, 666	37, 067	37, 067	28, 931
Refined products	498, 688	496, 958	494, 530	503, 410	510, 361	517, 758	539, 857	550, 664	558, 181	570, 912	562, 997	543, 343	543, 343	515, 827
Total stocks	759, 439	752, 216	766, 999	791, 134	807, 200	817, 002	838, 232	841, 571	853, 618	866, 201	853, 344	825, 074	825, 074	784, 558

707-633—63——25

TABLE 2.—Supply and demand of all oils in the United States, 1960 total and 1961–62, by months—Continued

(Thousand barrels)

	1962 [3]													1961 total
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
New supply:														
Domestic production:														
Crude petroleum	227,756	209,068	228,668	221,737	222,969	217,712	224,018	224,240	219,593	228,380	223,220	228,824	2,676,185	2,621,758
Natural-gas liquids	31,851	29,185	31,964	30,330	30,371	29,117	30,955	30,430	30,204	31,457	31,876	33,249	370,989	361,689
Benzol, etc	9	5	4	10	6	4	3	4	10	12	13	11	91	169
Total production	259,616	238,258	260,636	252,077	253,346	246,833	254,976	254,674	249,807	259,849	255,109	262,084	3,047,265	2,983,616
Imports: [1]														
Crude petroleum	36,349	31,603	31,761	32,249	34,181	33,817	35,936	40,293	34,407	35,828	33,266	31,349	411,039	381,548
Refined products	39,259	27,916	33,855	26,910	25,058	24,726	22,832	24,531	27,168	26,884	31,578	37,236	347,953	318,118
Total new supply	335,224	297,777	326,252	311,236	312,585	305,376	313,744	319,498	311,382	322,561	319,953	330,669	3,806,257	3,683,282
Increase (+) or decrease (−) in stocks	−37,083	−13,125	−10,786	+19,784	+14,581	+14,067	+17,550	+17,337	+21,105	+10,997	−15,930	−26,702	+11,795	+40,516
Demand:														
Total demand	372,307	310,902	337,038	291,452	298,004	291,309	296,194	302,161	290,277	311,564	335,883	357,371	3,794,462	3,642,766
Exports: [2]														
Crude petroleum	99	137	215	87	340	42	190	184	95	3	249	145	1,786	3,227
Refined products	4,706	4,991	4,589	4,932	5,198	4,803	5,044	5,178	5,658	4,001	4,821	5,590	59,511	60,336
Domestic demand:														
Gasoline	121,426	109,186	130,401	129,493	140,659	140,366	142,532	147,218	126,361	136,928	133,192	125,642	1,583,404	1,533,173
Kerosine	21,114	15,986	15,044	10,646	8,965	9,216	10,894	10,634	12,047	13,573	16,163	19,738	164,020	144,435
Distillate fuel oil	101,135	82,350	75,566	53,721	44,620	40,036	40,591	36,570	45,231	51,327	71,963	89,813	732,085	694,356
Residual fuel oil	63,852	50,422	55,613	40,470	38,645	34,532	33,672	35,037	37,968	43,094	52,377	58,862	545,382	548,678
Military jet fuel	9,495	7,259	9,636	8,942	10,034	10,415	8,733	10,118	11,592	8,928	8,393	8,856	112,401	104,436
Lubricants	3,490	3,524	3,566	3,813,	3,984	3,744	3,636	3,829	3,474	3,896	3,623	3,027	43,606	41,534
Miscellaneous	46,990	37,047	42,408	39,348	45,559	48,155	50,902	53,393	47,851	49,814	45,102	45,698	552,267	512,591
Total domestic demand	367,502	305,774	332,234	286,433	292,466	286,464	290,960	296,799	284,524	307,560	330,813	351,636	3,733,165	3,579,203
Stocks:														
Crude petroleum	242,444	240,166	245,632	255,859	255,676	247,740	242,418	243,588	244,226	251,719	256,284	252,011	252,011	244,664
Natural-gas liquids	29,859	30,019	30,233	32,817	35,326	37,323	39,093	40,284	40,393	39,331	36,677	31,385	31,385	37,067
Refined products	515,688	504,681	488,215	495,188	507,443	527,449	548,551	563,527	583,885	588,451	570,610	553,473	553,473	543,343
Total stocks	787,991	774,866	764,080	783,864	798,445	812,512	830,062	847,399	868,504	879,501	863,571	836,869	836,869	825,074

---

[1] Bureau of Mines data for crude oil and unfinished oils; U.S. Department of Commerce data for all other imports.

[2] U.S. Department of Commerce data. [3] Preliminary figures.

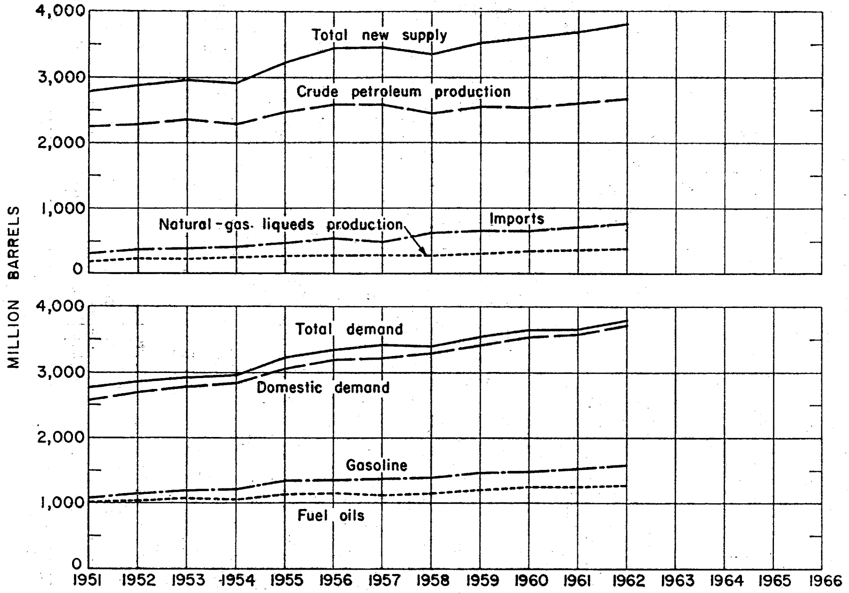


FIGURE 1.—Supply and demand of all oils in the United States, 1951–62.

TABLE 3.—Demand for all oils[1] in the United States, 1953–62

(Million barrels)

Year	Domestic demand	Exports	Total demand	Year	Domestic demand	Exports	Total demand
1953	2,775.3	146.6	2,921.9	1958	3,315.2	100.6	3,415.8
1954	2,832.4	129.7	2,962.1	1959	3,449.6	77.1	3,526.7
1955	3,087.8	134.2	3,222.0	1960	3,535.8	73.9	3,609.7
1956	3,213.2	157.4	3,370.6	1961	3,579.2	63.6	3,642.8
1957	3,218.6	207.2	3,425.8	1962[2]	3,733.2	61.3	3,794.5

[1] See text footnote 4 at the beginning of this chapter.
[2] Preliminary figures.

refined products in the United States. The object of limiting data to the United States is to permit a breakdown and balancing of supply and demand of operations by States and districts. The composition of the districts used by the Bureau of Mines is explained in the next section.

The increasing volume of natural-gas liquids recovered from natural gas has made it necessary to present data on these liquids with the crude oil data, as they are either blended with refinery products or are identical with materials recovered from refinery gases. These natural-gas liquids are recovered at special plants away from the oil refineries.

Most of the data were compiled by the Bureau of Mines from detailed reports submitted on a voluntary basis by the various companies. These data are published monthly for release about 8 weeks after the end of the month concerned. Complete coverage, with only minor estimates, is procured for production, stocks, and refinery operations. The Bureau of Mines used the import data as reported by the refineries for crude oil and unfinished oils. Other product imports and all export data were taken from records of the U.S. Department of Commerce.

The impossibility of contacting many small producers to obtain current monthly data for crude-oil production makes it necessary to use pipeline company reports. These companies report by States of origin and list stocks on leases, oil taken from the leases, pipeline and tank farm stocks, and crude deliveries. The data are cross-checked against reports from refineries showing crude receipts by States of origin and method of transportation. These reports include information covering final receipts by water, tank cars, and trucks and cover stocks of crude oil, held at refineries, by States of origin. The data are verified further with available current and annual production figures collected by State agencies and supplemented by estimates of unreported lease stocks. The Bureau of Mines crude production figure includes field condensate.

Individual refineries reported monthly receipts, input, stocks at the beginning and end of the month, refinery production, and deliveries. Data on both product stocks at refineries and pipeline and bulk terminal stocks are collected.

Semiannual canvasses of refineries, pipeline companies, and natural-gas liquids plants provide data on storage tank capacities assigned to the various refined products and to liquefied gases at plants, terminals, and underground storage facilities.

Annual canvasses provide supplemental information on the value of crude petroleum at wells, the number of producing oil wells, sales of fuel oils, asphalt and road oils by uses, and refinery capacity.

The table showing world production of crude oil by countries is based on monthly reports that also included data on crude movements and refinery operations. Data on crude reserves, wells drilled, and current prices were taken from the sources indicated in the footnotes.

DISTRICTS

The Bureau of Mines reported production of crude petroleum and natural-gas liquids and the number of wells drilled by States. Louisiana, New Mexico, and Texas were also reported by districts.

Louisiana is divided into a Northern Louisiana district and a Louisiana Gulf Coast district. The Gulf Coast district includes Vernon, Rapides, Avoyelles, Pointe, Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, and Washington Parishes and all parishes in the State south of these. All parishes not included in the Gulf Coast district are in the Northern Louisiana district.

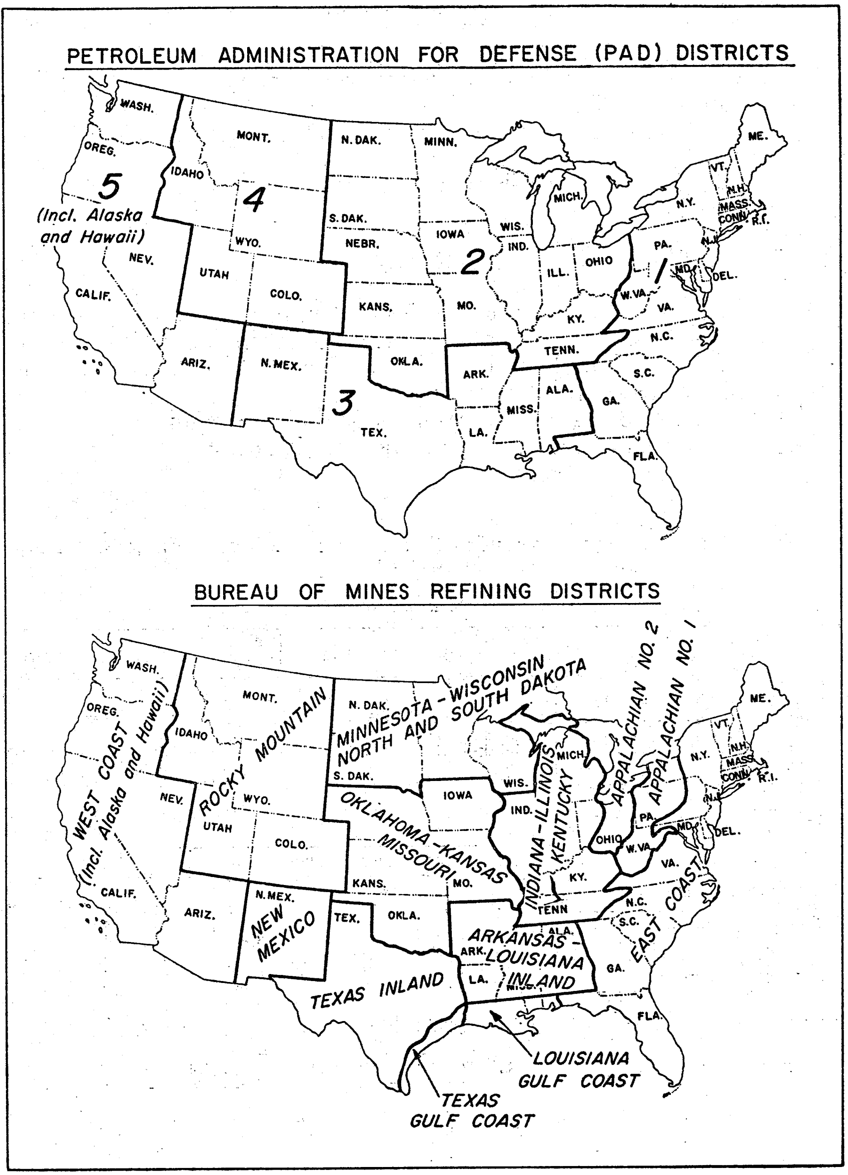
New Mexico has two widely separated producing areas. The Southeastern district comprises mainly Lea, Eddy, Chaves, and Roosevelt Counties. The Northwestern district comprises mainly San Juan, Rio Arriba, Sandoval, and McKinley Counties.

The Bureau of Mines producing districts in Texas correspond, with one exception, to grouping of the Texas Railroad commission districts.

Bureau of Mines district:	*Railroad Commission district:*
Gulf Coast	Nos. 2 and 3.
West Texas	Nos. 7C and 8.
East Proper	Part of No. 6 (East Texas field in Cherokee, Smith, Upshur, Rush and Gregg Counties).
Panhandle	No. 10.
Rest of State:	
North	Nos. 7B and 9.
Central	No. 1.
South	No. 4.
Other East Texas	Nos. 5 and 6 (exclusive of East Proper).

The Bureau of Mines groups refinery operations into another set of districts called refining districts. These refining districts correspond with the grouping originated by the Petroleum Administration for War during World War II and called PAW districts (later changed to PAD districts).

PAD district:	*Refining district*
1	*East Coast*—District of Columbia and Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida; and the following counties of New York: Cayuga, Tompkins, Chemung, and all counties east and north thereof; and the following counties of Pennsylvania: Bradford, Sullivan, Columbia, Montour, Northumberland, Dauphin, York, and all counties east thereof.
1	*Appalachian No. 1*—West Virginia and those parts of Pennsylvania and New York not included in the East Coast district.
2	*Appalachian No. 2*—The following counties of Ohio: Erie, Huron, Crawford, Marion, Delaware, Franklin, Pickaway, Ross, Pike, Scioto, and all counties east thereof.
2	*Indiana-Illinois-Kentucky*—Indiana, Illinois, Kentucky, Tennessee, Michigan, and that part of Ohio not included in the Appalachian district.
2	*Oklahoma-Kansas-Missouri*—Oklahoma, Kansas, Missouri, Nebraska, and Iowa.
2	*Minnesota-Wisconsin-North Dakota-South Dakota*—Minnesota, Wisconsin, North Dakota, and South Dakota.
3	*Texas Inland*—Texas, except Texas Gulf Coast district.
3	*Texas Gulf Coast*—The following counties of Texas: Newton, Orange, Jefferson, Jasper, Tyler, Hardin, Liberty, Chambers, Polk, San Jacinto, Montgomery, Harris, Galveston, Waller, Fort Bend, Brazoria, Wharton, Matagorda, Jackson, Victoria, Calhoun, Refugio, Aransas, San Patricio, Nueces, Kleberg, Kenedy, Willacy, and Cameron.
3	*Louisiana Gulf Coast*—The following parishes of Louisiana: Vernon, Rapides, Avoyelles, Pointe Coupee, West Feliciana, East Feliciana, Tangipahoa, St. Helena, Washington, and all parishes south thereof; the following counties of Mississippi: Pearl River, Stone, George, Hancock, Harrison, and Jackson, and Mobile and Baldwin Counties, Alabama.
3	*North Louisiana-Arkansas*—Arkansas and those parts of Louisiana, Mississippi and Alabama not included in the Louisiana Gulf Coast district.
3	*New Mexico*—New Mexico.
4	*Rocky Mountain*—Montana, Idaho, Wyoming, Utah, and Colorado.
5	*West Coast*—Washington, Oregon, California, Nevada, Alaska, Arizona, and Hawaii.



PETROLEUM ADMINISTRATION FOR DEFENSE (PAD) DISTRICTS

BUREAU OF MINES REFINING DISTRICTS

FIGURE 2.—Map of PAD Districts and Bureau of Mines Refining Districts.

WORLD OIL SUPPLY

The production of crude oil for the world in 1962 was 8,879 million barrels, compared with 8,186 million in 1961. The U.S. proportion of world production was 30.1 percent in 1962, 1.9 percent less than in 1961.

The world demand for petroleum was 9,094 million barrels, a gain of 8.4 percent for the year.

RESERVES

The American Petroleum Institute Committee on Petroleum Reserves estimated proved reserves of crude oil in the United States to be 31,389.2 million barrels on December 31, 1962, a decline of 369.3 million barrels for the year.

The estimates of crude-oil reserves include only oil recoverable under existing economics and operating conditions.

TABLE 4.—Estimates of proved crude-oil reserves in the United States on Dec. 31 by States [1]

(Million barrels)

State	1955	1956	1957	1958	1959	1960	1961	1962
Eastern States:								
Illinois	691	700	655	608	594	556	503	460
Indiana	62	68	67	71	74	66	62	61
Kentucky	107	149	138	126	136	129	116	109
Michigan	59	55	49	45	55	78	79	75
New York	43	40	37	36	34	32	28	23
Ohio	56	64	68	71	74	75	76	77
Pennsylvania	93	135	126	120	114	108	102	97
West Virginia	47	51	53	52	51	51	51	56
Total	1,158	1,262	1,193	1,129	1,132	1,095	1,017	958
Central and Southern States:								
Arkansas	330	318	305	318	313	302	281	247
Kansas	998	992	947	922	917	884	878	862
Louisiana [2]	3,255	3,675	3,858	4,044	4,660	4,785	4,931	5,087
Mississippi	388	368	360	379	389	407	401	388
Nebraska	57	63	63	69	81	86	100	94
New Mexico	820	836	832	894	1,026	1,084	1,090	1,065
North Dakota	185	196	258	314	382	431	413	404
Oklahoma	2,016	2,010	1,941	1,898	1,865	1,791	1,787	1,728
Texas [2]	14,934	14,783	14,555	14,322	14,860	14,758	14,850	14,648
Total	22,983	23,241	23,119	23,160	24,493	24,528	24,731	24,523
Mountain States:								
Colorado	334	364	310	392	381	364	420	388
Montana	299	331	320	338	309	267	251	249
Utah	37	61	140	199	195	208	218	198
Wyoming	1,374	1,363	1,420	1,409	1,403	1,427	1,381	1,297
Total	2,044	2,119	2,190	2,338	2,288	2,266	2,270	2,132
Pacific Coast States: California [2]	3,801	3,771	3,760	3,866	3,763	3,659	3,615	3,648
Other States [3]	26	42	38	43	43	65	126	128
Total United States	30,012	30,435	30,300	30,536	31,719	31,613	31,759	31,389

[1] From reports of Committee on Petroleum Reserves, American Petroleum Institute. Includes crude oil that may be extracted by present methods from fields completely developed or sufficiently explored to permit reasonably accurate calculations. The change in reserves during any year represents total new discoveries, extensions, and revisions, minus production.

[2] Includes offshore reserves.

[3] Includes Alabama, Arizona, Florida, Missouri, Nevada, South Dakota, Tennessee, Virginia, Washington 1955–60, and Alaska 1959–62.

CRUDE PETROLEUM

SUPPLY AND DEMAND

The new supply of crude petroleum was derived primarily from domestic production, but the supply was augmented by imports. Crude imports represented 13.3 percent of the crude supply in 1962, compared with 12.7 percent in 1961. Under the mandatory import control program, which became effective March 1959, imports of crude-oil, unfinished oils, and refined products other than residual fuel oil are limited to a percentage of the estimated total demand for all products in all States east of the Rocky Mountains. In States west of the Rocky Mountains, including Alaska and Hawaii, the import quota is based on the difference between the estimated available domestic supply and the estimated total demand. Overland receipts (imports from Canada and Mexico) are exempted from provisions of the program; however, before setting the allocations for crude and unfinished oils in the States west of the Rocky Mountains, an estimate of probable receipts by pipeline from Canada is subtracted from the difference between domestic supply and the total demand. Vessel and aircraft fuels imported in bond for use as fuel outside the United States are also exempted from provisions of the program. All refineries of record are granted an allocation based on their refinery throughput, certain special provisions are applied to refineries that imported crude-oil during 1957, the base year for the program.

The major part of the indicated demand for crude petroleum is converted into products before final consumption (99.7 percent in 1962), and the remainder represents exports, fuel, and losses.

TABLE 5.—Supply and demand [1] for crude petroleum in the United States

(Thousand barrels)

	1958	1959	1960	1961	1962 [2]
Production	2, 448, 987	2, 574, 590	2, 574, 933	2, 621, 758	2, 676, 185
Imports [3]	348, 007	352, 344	371, 575	381, 548	411, 039
Total new supply	2, 796, 994	2, 926, 934	2, 946, 508	3, 003, 306	3, 087, 224
Increase (+) or decrease (−) in stocks, end of year	−19, 083	−5, 613	−17, 329	+4, 864	+7, 347
Demand:					
Domestic crude	2, 466, 357	2, 578, 203	2, 592, 289	2, 614, 919	2, 669, 394
Foreign crude	349, 720	354, 344	371, 548	383, 523	410, 483
Total demand	2, 816, 077	2, 932, 547	2, 963, 837	2, 998, 442	3, 079, 877
Runs to stills:					
Domestic	2, 444, 229	2, 565, 504	2, 581, 568	2, 604, 127	2, 659, 826
Foreign	345, 175	352, 157	370, 966	383, 031	409, 805
Exports [4]	4, 346	2, 526	3, 087	3, 227	1, 786
Transfers to fuel oil:					
Distillate	950	970	1, 001	851	1, 198
Residual	10, 965	7, 386	3, 948	3, 854	3, 797
Other fuel losses	10, 412	4, 004	3, 267	3, 352	3, 465
Total demand	2, 816, 077	2, 932, 547	2, 963, 837	2, 998, 442	3, 079. 877

[1] For definition see footnote 4 at the beginning of this chapter.
[2] Preliminary figures.
[3] Bureau of Mines data.
[4] U.S. Department of Commerce data.

TABLE 6.—Supply of and demand for crude petroleum in the United States, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Supply:													
Production	223,497	204,274	231,596	219,846	221,553	213,084	215,699	220,218	209,848	220,942	214,566	226,635	2,621,758
Imports [1]	33,688	28,768	33,276	26,969	33,566	27,186	37,975	34,048	33,147	33,585	30,119	29,221	381,548
Total new supply	257,185	233,042	264,872	246,815	255,119	240,270	253,674	254,266	242,995	254,527	244,685	255,856	3,003,306
Change in stocks, end of period:													
Domestic	−4,365	−3,201	+10,507	+12,775	+2,934	+2,813	−7,023	−8,201	+3,319	−1,026	−874	−819	+6,839
Foreign	+1,334	−1,505	+2,351	−1,551	+2,361	−3,197	+2,920	−627	−412	+1,133	−1,584	−3,198	−1,975
Demand:													
Domestic	227,862	207,475	221,089	207,071	218,619	210,271	222,722	228,419	206,529	221,968	215,440	227,454	2,614,919
Foreign	32,354	30,273	30,925	28,520	31,205	30,383	35,055	34,675	33,559	32,452	31,703	32,419	383,523
Runs to stills:													
Domestic	227,101	206,546	219,888	206,139	217,817	209,302	221,958	227,483	205,764	221,120	214,471	226,538	2,604,127
Foreign	32,248	30,210	31,076	28,438	31,156	30,277	35,016	34,626	33,516	32,414	31,671	32,383	383,031
Exports [2]	135	295	339	316	229	435	178	309	130	190	400	271	3,227
Transfers:													
Distillate	81	79	77	68	66	61	66	70	71	69	69	74	851
Residual	366	344	354	363	277	309	272	314	338	343	256	318	3,854
Losses	285	274	280	267	279	270	287	292	269	284	276	289	3,352
1962: [3]													
Supply:													
Production	227,756	209,068	228,668	221,737	222,969	217,712	224,018	224,240	219,593	228,380	223,220	228,824	2,676,185
Imports [1]	36,349	31,603	31,761	32,249	34,181	33,817	35,936	40,293	34,407	35,828	33,266	31,349	411,039
Total new supply	264,105	240,671	260,429	253,986	257,150	251,529	259,954	264,533	254,000	264,208	256,486	260,173	3,087,224
Change in stocks, end of period:													
Domestic	−4,805	−3,003	+7,175	+6,313	−964	−6,442	−4,588	−757	+1,765	+6,649	+6,064	−616	+6,791
Foreign	+2,585	+725	−1,709	+3,914	+781	−1,494	−734	+1,927	−1,127	+844	−1,499	−3,657	+556
Demand:													
Domestic	232,561	212,071	221,493	215,424	223,933	224,154	228,606	224,997	217,828	221,731	217,156	229,440	2,669,394
Foreign	33,764	30,878	33,470	28,335	33,400	35,311	36,670	38,366	35,534	34,984	34,765	35,006	410,483
Runs to stills:													
Domestic	231,729	211,230	220,657	214,741	222,917	223,505	227,678	224,329	216,952	221,225	216,289	228,574	2,659,826
Foreign	33,548	30,735	33,331	28,220	33,366	35,277	36,759	38,199	35,711	34,848	34,736	35,075	409,805
Exports [2]	99	137	215	87	340	42	190	184	95	3	249	145	1,786
Transfers:													
Distillate	217	147	173	115	66	69	64	68	73	73	65	68	1,198
Residual	423	425	303	305	358	283	291	290	248	280	301	290	3,797
Losses	309	275	284	291	286	289	294	293	283	286	281	294	2,465

[1] Bureau of Mines data. [2] U.S. Department of Commerce data. [3] Preliminary figures.

PRODUCTION

GENERAL

Crude-oil production in the United States in 1962 averaged 7,332,000 barrels daily and exceeded by 2.1 percent (149,000 barrels daily) the previous record high of 1961. Production exceeded the demand in 1962 by 19,000 barrels daily and stocks of domestic crude oil increased 6.8 million barrels.

BY STATES

Additional data on production by States will be found in Volume III of the Minerals Yearbook.

TABLE 7.—Petroleum produced in the United States, by States [1]

(Thousand barrels unless otherwise stated)

	1958	1959	1960	1961	1962 [2]	1859-1962 total [3]
Production:						
Alabama	5,887	5,524	7,329	6,931	7,493	51,290
Alaska	----------	187	559	6,327	10,260	17,333
Arkansas	28,700	26,329	30,117	29,246	27,585	1,144,899
California	313,672	308,946	305,352	299,609	296,572	12,623,922
Colorado	48,736	46,440	47,469	46,759	42,460	685,821
Florida	449	424	369	374	418	7,327
Illinois	80,275	76,727	77,341	76,818	77,325	2,381,810
Indiana	11,864	11,554	12,054	11,500	11,709	341,731
Kansas	119,942	119,543	113,453	112,241	112,076	[4] 3,535,832
Kentucky	17,509	27,272	21,147	18,344	18,122	[5] 453,664
Louisiana	313.891	362,666	400.832	424,962	483,101	[6] 426,195
Michigan	9,308	10,439	15.899	18,901	17,117	[6] 477,577
Mississippi	39,512	49,620	51,673	54,688	54,471	794,719
Montana	27,957	29,857	30,240	30,906	31,648	428,124
Nebraska	20,373	22,881	23,825	24,369	24,850	190,020
Nevada	40	32	27	154	137	595
New Mexico	98,515	105,692	107,380	112,553	108,708	[7] 1,737,514
New York	1,763	1,970	1,813	1,658	1,789	[8] 199.476
North Dakota	14,259	17,824	21,992	23,652	25.164	153,570
Ohio	6,260	5,978	5,405	5,639	5,066	677,943
Oklahoma	200,699	198,090	192,913	193,081	198,616	8.617,573
Pennsylvania	6,472	6,160	6,009	5,643	5,225	1,232,356
Texas	940,166	971,978	927,479	939,191	936,508	25,699,001
Utah	24,811	39,959	37,594	33,118	30,964	[9] 184,141
West Virginia	2,186	2,184	2.300	2,760	3,345	471,748
Wyoming	115.572	126,050	133,910	141,937	145,167	2,205,485
Other States [10]	[11] 169	264	452	397	289	4,104
Total	2,448,987	2,574,590	2,574,933	2,621,758	2,676,185	70,743,770
Value at wells:						
Total (thousand dollars)	7,379,973	7,473,336	7,420,181	7,565,582	7,768,822	142,372,821
Average per barrel	$3.01	$2.90	$2.88	$2.89	$2.90	$2.01

---

[1] For detailed figures by States, 1859-1935, see Minerals Yearbook. 1937, p. 1008.
[2] Preliminary figures.
[3] Revised.
[4] Oklahoma included with Kansas in 1905 and 1906.
[5] Includes Tennessee, 1883-1907.
[6] Figures represent 1925-62 production only; earlier years included with "Other States."
[7] Figures represent 1924-62 production only; earlier years included with "Other States."
[8] Early production in New York included with Pennsylvania.
[9] Figures represent 1946-62 production only; earlier years included with "Other States."
[10] Includes Alaska 1912-33; Arizona, 1958-62; Arkansas, 1920; Michigan, 1900-1919; Mississippi, 1933-35; Missouri, 1899-1911; 1913-16; 1919-23, 1932-6; New Mexico, 1913, 1919-23; South Dakota, 1955-62; Tennessee, 1916-62; Utah, 1907-11, 1920, 1924-41; Virginia, 1943-62; Washington, 1958-60.
[11] Does not include 29,000 barrels produced in Alaska.

TABLE 8.—Production of crude petroleum in the United States in 1961–62, by States and months [1]

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Alabama	618	562	625	621	643	504	442	565	549	583	586	633	6,931
Alaska	192	243	320	379	454	532	579	664	655	715	795	799	6,327
Arkansas	2,494	2,434	2,615	2,496	2,448	2,359	2,402	2,403	2,341	2,403	2,410	2,441	29,246
California [2]	25,644	23,247	25,797	24,706	25,602	24,578	25,235	25,194	24,450	25,471	24,520	25,165	299,609
Colorado [3]	4,088	3,697	4,108	3,925	3,967	3,806	3,850	3,932	3,831	3,960	3,775	3,820	46,759
Florida	34	31	32	30	32	31	26	33	31	30	27	37	374
Illinois	6,325	5,844	6,621	6,258	6,431	6,392	6,405	6,786	6,448	6,682	6,375	6,251	76,818
Indiana	988	893	977	893	903	769	1,372	974	926	958	891	956	11,500
Kansas [4]	9,620	8,887	9,697	9,276	9,538	9,237	9,287	9,626	9,137	9,551	9,232	9,153	112,241
Kentucky	1,504	1,455	1,589	1,490	1,580	1,536	1,579	1,600	1,496	1,561	1,484	1,470	18,344
Louisiana [5]	35,677	31,933	35,395	35,287	36,490	35,525	35,383	35,513	33,459	36,689	35,899	37,712	424,962
Michigan [6]	1,666	1,523	1,667	1,597	1,663	1,635	1,541	1,556	1,502	1,545	1,497	1,509	18,901
Mississippi	4,626	4,160	4,661	4,512	4.660	4,341	4,630	4,649	4,498	4,648	4,593	4,710	54,688
Montana [7]	2,584	2,330	2,525	2,465	2,596	2,482	2,644	2,698	2,596	2,694	2,628	2,664	30,906
Nebraska	2,031	1,909	2,110	2,030	1,959	1,904	1,846	1,937	2,079	2,260	2,157	2,147	24,369
New Mexico [8]	9,313	8,598	9,627	9,523	9,715	9,307	9,401	9,653	9,274	9,606	9,247	9,289	112,553
New York	130	121	142	161	145	139	132	140	128	139	131	150	1,658
North Dakota [9]	1,990	1,899	2,067	1,750	1,434	1,788	2,068	2,132	2,069	2,100	2,111	2,244	23,652
Ohio	447	417	473	428	483	470	482	523	477	499	482	458	5,639
Oklahoma	16,835	15,357	17,089	16,489	16,493	15,277	15,563	16,103	15,516	16,158	15,350	16,851	193,081
Pennsylvania	467	432	510	431	520	493	471	505	458	476	455	425	5,643
Texas	80,155	73,561	87,175	80,622	78,875	75,370	76,095	78.333	73,523	77,635	75,315	82,532	939,191
Utah [10]	3,392	2,758	2,860	2,593	2,622	2,815	2,514	2,545	2,670	2,839	2,753	2,757	33,118
West Virginia	197	194	217	202	232	231	225	244	237	266	272	243	2,760
Wyoming	12,442	11,745	12,644	11,634	12,018	11,517	11,481	11,863	11,454	11,426	11,537	12,176	141,937
Other States	38	44	53	48	50	46	46	47	44	48	44	43	[11] 551
Total: 1961	223,497	204,274	231,596	219,846	221,553	213,084	215,699	220,218	209,848	220,942	241,566	226,635	2,621,758
1960	224,140	209,986	220,977	211,132	212,296	208,161	212,645	215,145	209,119	215,687	213,992	221,653	2,574,933
Daily average, 1961	7,210	7,296	7,471	7,328	7,147	7,103	6,958	7,104	6,995	7,127	7,152	7,311	7,183
Pennsylvania Grade (included above)	927	877	1,021	933	1,061	1,026	997	1,082	1,002	1,061	1,038	987	12,012

1962: [12]												
Alabama	691	688	701	610	125	332	409	783	756	808	778	812	7,493
Alaska	809	768	825	848	878	861	883	884	830	890	878	906	10,260
Arkansas	2,342	2,193	2,358	2,298	2,380	2,285	2,329	2,309	2.190	2,335	2,259	2,307	27,585
California [2]	24,901	22,324	24,782	24,257	25,155	24,509	25,350	25,388	24,518	25,409	24,620	25,359	296,572
Colorado [3]	3,678	3,344	3,693	3,562	3,672	3,482	3,553	3,776	3,228	3,496	3,411	3,565	42,460
Florida	39	37	34	36	34	31	37	32	35	39	28	36	418
Illinois	6,520	6,164	6,620	6,342	6,476	6,310	6,537	6,445	6.445	6,523	6,613	6,330	77,325
Indiana	905	867	1,029	986	972	1,072	995	925	1.123	930	983	922	11.709
Kansas [4]	9,035	8,659	9,688	9,320	9,629	9,266	9,458	9,496	9,076	9,774	9,268	9,407	112,076
Kentucky	1,451	1,346	1,466	1,449	1,543	1,483	1.568	1,548	1,513	1.603	1,557	1,595	18,122
Louisiana [5]	39,859	36,800	40,931	39,718	39,199	37,897	39,254	40,144	40,728	43,001	41,862	43,708	483,101
Michigan [6]	1,497	1,223	1,629	1,440	1,435	1,446	1,450	1,442	1,371	1,440	1,378	1,366	17,117
Mississippi	4,320	3,957	4,662	4,362	4,624	4,486	4,755	4,866	4.014	4,867	4,708	4,850	54.471
Montana [7]	2,636	2,423	2,699	2,567	2,672	2,576	2,735	2,713	2,627	2,725	2,609	2,666	31,648
Nebraska	2,102	1,877	2,148	2,096	2,169	2.077	2.141	2,120	2,058	2,068	1,983	2,011	24,850
New Mexico [8]	9,159	8,525	9,582	9,087	9,200	8,690	8,993	8,931	8,738	9,169	9,164	9,470	108,708
New York	147	134	149	147	158	151	176	160	132	155	146	134	1,789
North Dakota [9]	2,230	1,957	2,203	2,065	2,114	2,046	2,171	2,020	1,723	2,148	2,089	2,398	25,164
Ohio	432	382	440	425	456	425	436	446	404	430	423	367	5,066
Oklahoma	16,997	15,712	17,497	16,999	16,237	16,026	16,479	16,491	16,356	16,729	16,448	16,645	198,616
Pennsylvania	447	400	443	471	469	432	438	452	412	458	425	378	5,225
Texas	82,172	75,066	79,785	77,873	78,630	76,861	78,634	78,056	76,605	77,997	76.806	78.023	936,508
Utah [10]	2,809	2,245	2,562	2,339	2,448	2,404	2,507	2,587	2,631	2,804	2,705	2,923	30,964
West Virginia	267	239	300	284	311	299	314	310	259	300	272	190	3,345
Wyoming	12,269	11,700	12,401	12,126	11,949	12,235	12,380	11,883	11,786	12,246	11,771	12,421	145,167
Other States	42	38	41	30	34	30	36	33	35	36	36	35	[13] 426
Total: 1962	227,756	209,068	228,668	221,737	222,969	217.712	224.018	224,240	219,593	228,380	223,220	228,824	2,676,185
1961	223,497	204,274	231,596	219,846	221,553	213,084	215,699	220,218	209,848	220.942	214,566	226,635	2,621,758
Daily average, 1962	7,347	7,467	7,376	7,391	7,193	7,257	7,226	7,234	7,320	7,367	7,441	7,381	7,332
Pennsylvania Grade (included above)	1,044	935	1,078	1,075	1,133	1,068	1,112	1,116	976	1,087	1,012	855	12,491

---

[1] Includes field condensate.

[2] Conservation Committee of California Oil Producers.

[3] Colorado Oil and Conservation Commission.

[4] Kansas Geological Survey.

[5] Louisiana Convervation Commission.

[6] Michigan Department of Conservation.

[7] Montana Oil Conservation Board.

[8] New Mexico Oil and Gas Conservation Commission.

[9] North Dakota Geological Survey.

[10] Utah Oil and Gas Conservation Commission.

[11] Includes Arizona (73), Missouri (72), Nevada (154), South Dakota (233), Tennessee (17), and Virginia (2).

[12] Preliminary figures.

[13] Arizona (43), Missouri (55), Nevada (137), South Dakota (170), Tennessee (18), and Virginia (3).

TABLE 9.—Percentage of total crude petroleum produced in the United States, by States

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962[1]
Texas	43.2	42.1	42.4	42.3	41.0	38.4	37.8	36.0	35.8	34.9
Louisiana	10.9	10.6	10.9	11.4	12.6	12.8	14.1	15.6	16.2	18.1
California	15.5	15.4	14.3	13.4	13.0	12.8	12.0	11.8	11.4	11.1
Oklahoma	8.6	8.0	8.2	8.2	8.2	8.2	7.7	7.5	7.4	7.4
Wyoming	3.5	4.0	4.0	4.0	4.2	4.7	4.9	5.2	5.4	5.4
Kansas	4.9	5.2	4.9	4.7	4.7	4.9	4.6	4.4	4.3	4.2
New Mexico	3.0	3.2	3.3	3.4	3.6	4.0	4.1	4.2	4.3	4.1
Illinois	2.5	2.9	3.3	3.1	2.9	3.3	3.0	3.0	2.9	2.9
Mississippi	1.5	1.5	1.5	1.6	1.5	1.6	1.9	2.0	2.1	2.0
Colorado	1.5	2.0	2.1	2.2	2.1	2.0	1.8	1.9	1.8	1.6
Montana	.5	.6	.6	.8	1.0	1.1	1.2	1.2	1.1	1.2
Arkansas	1.3	1.3	1.1	1.1	1.2	1.2	1.0	1.2	1.2	1.0
Kentucky	.5	.6	.6	.7	.7	.7	1.1	.8	.7	.7
Michigan	.5	.5	.5	.4	.4	.4	.4	.6	.7	.6
Other States	2.1	2.1	2.3	2.7	2.9	3.9	4.4	4.6	4.7	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Preliminary figures.

TABLE 10.—Production of crude petroleum in leading fields in the United States, and total production since discovery[1]

(Thousand barrels)

Field[2]	State	1961	1962	Total since discovery[3]
East Texas	Texas	44,064	38,347	3,544,078
Wilmington	California	27,948	31,725	943,629
Sho-Vel-Tum	Oklahoma	24,510	24,350	597,723
Elk Basin	Montana, Wyoming	23,306	23,850	230,591
Coalinga, all fields	California	20,713	20,603	884,075
Seeligson (all zones)	Texas	19,342	20,518	235,047
Caillou Island	Louisiana	17,634	19,828	197,184
Ward-Estes	Texas	17,095	19,216	150,873
Bay Marchand, Block 2	Louisiana	16,723	17,233	79,517
South Pass, Block 24	do	15,671	16,578	174,867
Rangely	Colorado	16,566	16,230	332,778
Kelly-Snyder	Texas	16,894	16,139	289,469
Goldsmith	do	17,959	16,034	317,021
Huntington Beach	California	15,940	15,488	698,876
Midway Sunset	do	14,565	14,950	912,819
Loudon	Illinois	13,356	14,925	276,366
Burbank	Oklahoma	15,275	14,290	408,155
Timbalier Bay	Louisiana	11,860	14,124	82,551
Ventura	California	16,233	13,809	669,900
Cowden, all fields	Texas	14,102	13,296	357,720
Wasson	do	11,212	12,268	378,110
West Delta, Block 30	Louisiana	8,809	12,046	43,331
South Pass, Block 27	do	8,980	11,585	41,667
San Ardo	California	11,743	11,152	125,090
Kern Front and Kern River	do	10,615	11,078	374,365
Golden Trend	Oklahoma	10,202	10,730	228,568
Lake Washington	Louisiana	10,618	10,621	84,441
Salem	Illinois	9,659	10,590	300,295
Katy, North	Texas	9,204	10,271	152,864
Swanson River-Soldatna	Alaska	6,300	10,252	17,332
Cuyama Group	California	11,154	9,904	160,357
Lake Barre	Louisiana	6,438	9,476	54,430
Spraberry Trend	Texas	10,801	9,400	160,515
Hamilton Dome	Wyoming	8,963	9,180	88,581
Slaughter	Texas	8,615	8,658	286,263
Main Pass, Block 69	Louisiana	7,227	8,592	61,276
Weeks Island	do	9,538	8,557	117,154
Buena Vista	California	8,840	8,511	507,306
Hawkins	Texas	8,897	8,437	278,208
Bay St. Elaine	Louisiana	5,596	8,198	56,014
McElroy	Texas	8,407	7,957	202,774
West Bay	Louisiana	5,945	7,432	63,820
Hastings	Texas	7,744	7,431	326,591
Sand Hills	do	4,749	7,339	95,423
Grand Isle, Block 16	Louisiana	5,516	7,176	21,864
Salt Creek	Wyoming	6,217	7,073	397,640
High Island	Texas	5,334	6,998	74,756
Howard Glasscock	do	6,857	6,894	226,311

See footnotes at end of table.

TABLE 10.—Production of crude petroleum in leading fields in the United States, and total production since discovery [1]—Continued

(Thousand barrels)

Field [2]	State	1961	1962	Total since discovery [3]
Tom O'Connor	Texas	6,432	6,841	265,496
Eunice-Monument	New Mexico	7,039	6,741	289,848
Inglewood	California	5,760	6,716	233,742
TXL	Texas	6,280	6,677	170,753
Bayou Sale	Louisiana	5,387	6,677	80.387
Patrick Draw	Wyoming	8,117	6,590	17,253
Clay City	Illinois	6,683	6,495	232,499
Fullerton (& North & South)	Texas	6,187	6,397	155,375
Magnolia	Arkansas	5,493	6,334	115,869
Citronnelle	Alabama	5,769	6,334	33,365
Oregon Basin & West	Wyoming	5,875	6,330	109,880
Sleepy Hallow	Nebraska	3,074	6,121	9,373
Brea-Olinda	California	6,330	5,998	288,416
Baxterville	Mississippi	5,949	5,808	89,630
Belridge, South	California	4,738	5,747	94,448
Caprock & East	New Mexico	5.881	5,722	56,018
Caddo	Louisiana	5,638	5,704	268,949
Bradford-Allegheny [4]	Pennsylvania-New York	5,979	5,617	706,840
Grand Bay	Louisiana	3,568	5,613	77,567
Agua Dulce-Stratton	Texas	3,673	5,610	168.891
Keystone	do	7,456	5,528	182,899
Midland Farms	do	5,045	5.504	74.250
Vacuum	New Mexico	3,812	5,497	100,996
Diamond M	Texas	5,711	5,470	109,164
Bakke	do	4,751	5,448	20,935
Block 31	do	5.800	5.420	71,297
Little Creek	Mississippi	6,431	5,384	24.369
Webster	Texas	5,629	5.345	262,539
New Harmony	Illinois	5,246	5,333	115,691
Denton (all zones)	New Mexico	5,841	5,310	87,275
Empire-Abo	do	4,836	5,300	14,600
Emma (& Triple N)	Texas	5,743	5.252	52,150
Quarantine Bay	Lousisiana	4,678	5,241	75,758
Dune	Texas	4,287	5,234	30,785
South Mountain	California	5,834	5,228	98,138
Scipio	Michigan	6,090	5,157	17.454
Yates	Texas	4,427	5,154	477.349
Thompson, all fields	do	5,298	5,135	248,943
Pegasus	do	4,737	5,114	58,119
Long Beach	California	5.251	5.062	833.835
Grass Creek	Wyoming	4,602	5,025	85,769
Garland	do	5,111	5,000	69,573

[1] The data shown in this table was extracted from the Oil & Gas Journal and may not agree with the field breakdowns shown in other tables as reported.

[2] Fields under 5,000,000 barrels not shown for current year.

[3] Includes revisions.

[4] Bureau of Mines data.

NOTE: Fields that were shown in previous year may be grouped together with other fields and therefore cannot be shown separately.

TABLE 11.—Production of crude petroleum in Arkansas, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Dorcheat-Macedonia	605	369	633	603	518
El Dorado	1,337	1,034	1,176	597	471
Fouke	1,242	960	1,106	1,074	1,067
Magnolia	4,057	4,384	4,652	5,493	6,334
McKamie	1,235	1.016	1,264	1,387	1,836
Midway	1,801	2,067	2,209	2,208	2,106
Schuler	2,216	2,098	1,966	1,725	1,661
Smackover	4,636	4,265	3,870	3,267	3,161
Stephens	1,728	1,655	1,253	1,108	1,064
Village	714	433	666	529	498
Wesson	2,317	1,615	1,749	1,539	1,381
Other fields	6,812	6,433	9,573	9,716	7,488
Total Arkansas [3]	28,700	26,329	30,117	29,246	27,585

[1] Based on Oil and Gas Journal data adjusted to Bureau of Mines total.

[2] Preliminary figures.

[3] Arkansas Oil and Gas Commission data.

TABLE 12.—Production of crude petroleum in California by districts and fields

(Thousand barrels)

District and field	1958	1959	1960	1961	1962[1]
San Joaquin Valley:					
Belridge	4, 782	4, 620	5, 035	5, 178	5, 815
Buena Vista	6, 901	9, 815	9, 728	8, 837	8, 505
Coalinga	26, 740	21, 225	20, 621	22, 926	22, 547
Coles Levee	5, 443	4, 824	5, 659	5, 320	4, 625
Cuyama-Russell Ranch	15, 084	14, 544	14, 233	12, 988	13, 021
Edison	3, 808	3, 527	3, 033	2, 707	2, 555
Elk Hill	5, 361	5, 126	4, 368	4, 026	3, 865
Fresno Group		3, 033	3, 067	3, 163	2, 654
Fruitvale	2, 721	2, 500	2, 426	2, 493	2, 307
Greely	2, 981	2, 665	2, 460	2, 305	1, 800
Helm	829	883	1, 272	1, 337	1, 046
Kern River-Kern Front	6, 888	8, 648	9, 460	10, 819	11, 173
Kettleman North Dome	4, 786	3, 926	3, 478	2, 992	2, 711
Lost Hills	1, 324	1, 272	1, 499	1, 786	2, 017
McKittrick	7, 018	6, 512	7, 287	7, 589	7, 292
Midway-Sunset	13, 107	13, 126	13, 959	14, 557	14, 967
Mountain View	1, 523	1, 403	1, 587	1, 356	1, 101
Mount Poso	3, 392	3, 173	2, 854	2, 474	1, 842
Poso Creek	1, 342	1, 349	1, 354	1, 475	2, 139
Raisin City	1, 793	1, 668	1, 457	1, 277	1, 104
Rio Bravo	3, 629	3, 464	3, 260	2, 746	2, 330
Round Mountain	1, 497	1, 467	1, 408	1, 296	1, 197
Tejon Group	2, 722	5, 030	5, 105	4, 214	3, 219
Ten Section	1, 506	1, 614	1, 469	1, 279	1, 147
Wheeler Ridge		1, 849	2, 186	2, 422	2, 439
Other San Joaquin Valley	7, 074	11. 099	10, 550	8, 297	7, 199
Total San Joaquin Valley	132, 251	138, 362	138, 815	135, 859	130, 617
Coastal district:					
Aliso Canyon	2, 027	1, 876	1, 723	1, 578	
Cat Canyon	4, 197	4, 454	3, 361	3, 843	3, 803
Newall-Potrero	2, 871	2, 656	2, 239	2, 074	1, 939
Orcutt	1, 046	976	925	899	1, 029
Rincon	3, 527	3, 903	3, 991	3, 989	3, 732
San Ardo	10, 864	10, 994	11, 519	11, 744	11, 100
San Miguelita	2, 102	1, 841	1, 166	1, 064	1, 048
Santa Maria	2, 198	1, 968	1, 939	1, 667	1, 695
South Mountain	6, 980	7, 384	6, 709	5, 826	5, 212
Ventura	20, 451	18, 872	17, 065	16, 192	13, 790
Other Coastal	24, 823	23, 725	23, 780	22, 326	25, 393
Total Coastal district	81, 086	78. 149	74, 417	71, 202	68, 741
Los Angeles Basin:					
Brea Olinda	6, 362	5, 904	5, 884	6, 327	6, 014
Coyote	3, 942	2, 333	4, 302	4, 166	4, 387
Dominguez	3, 710	3, 417	3, 572	2, 974	2, 704
Huntington Beach	19, 447	18, 110	16, 761	15, 889	15, 497
Inglewood	4, 419	4, 280	4, 545	5, 771	6, 698
Long Beach	6, 167	5, 841	5, 615	5, 253	5, 048
Montebelle	1, 360	1, 331	1, 265	1, 268	1, 179
Newport	1. 467	2, 230	1, 248	1, 169	1, 108
Richfield	2, 133	2, 073	1, 985	1, 825	1, 810
Sansinena	2, 604	2, 219	2, 430	2, 065	2, 034
Santa Fe Springs	3, 890	3, 334	2, 887	2, 703	2, 460
Seal Beach	3, 881	3, 401	3, 249	3, 051	3, 046
Torrance	3, 084	2, 615	2, 260	2, 112	2, 098
Wilmington	31, 417	26, 993	27, 495	27, 978	31, 707
Other Los Angeles Basin	6, 452	8, 354	8, 622	9, 997	11, 424
Total Los Angeles Basin	100, 335	92, 435	92, 120	92, 548	97, 214
Total California[2]	313, 672	308, 946	305, 352	299, 609	296, 572

[1] Preliminary figures.
[2] Conservation Committee of California Oil Producers data.

TABLE 13.—Production of crude petroleum in Colorado, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Adena	4,965	6,463	7,567	7,744	4,697
Badger Creek—West	383	----------	570	630	----------
Big Beaver	1,062	1,014	990	840	778
Black Hollow	549	538	470	468	534
Bobcat	670	535	389	429	480
Cliff	553	557	484	425	----------
Graylin—South and Northwest	631	524	432	471	949
Little Beaver Creek	----------	----------	1,601	977	715
Little Beaver—East	1,754	1,666	914	1,152	503
Mt. Hope—East and North	430	689	----------	----------	----------
Plum Bush Creek	1,138	790	1,021	2,931	2,885
Rangely	20,914	17,980	17,135	16,566	16,230
Wilson Creek	2,396	2,709	2,800	2,509	2,256
Yenter	658	509	394	----------	----------
Other	12,633	12,466	12,702	11,617	12,433
Total Colorado [3]	48,736	46,440	47,469	46,759	42,460

---

[1] Based on Oil and Gas Journal data.
[2] Preliminary figures.
[3] Colorado Oil and Gas Conservation Commission data.

TABLE 14.—Production of crude petroleum in Illinois, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Albion	1,377	1,113	888	863	772
Benton	606	529	467	442	565
Centralia	3,480	2,160	1,420	995	1,238
Clay City	7,972	7,269	7,470	6,683	6,495
Dale	2,485	1,979	2,506	3,136	2,852
East Inman	1,537	1,126	746	495	593
Johnsonville	992	1,698	1,438	1,433	1,720
Loudon	13,158	12,586	12,628	13,356	14,925
New Harmony	4,430	4,758	5,252	5,246	5,333
Old Illinois (Bridgeport, Casey and Robinson-Stoy)	8,035	9,461	12,225	12,483	11,275
Phillipstown	691	606	653	622	665
Roland	2,155	1,860	1,545	1,304	1,175
Sailor Springs	1,531	1,378	1,382	1,281	1,216
Salem	6,475	6,926	8,482	9,659	10,590
Other fields	25,351	23,278	20,239	18,820	17,911
Total Illinois	80,275	76,727	77,341	76,818	77,325

---

[1] Based on Oil and Gas Journal data adjusted to Bureau of Mines total.
[2] Preliminary figures.

TABLE 15.—Pipeline runs of crude petroleum in Kansas, by fields

(Thousand barrels)

Field	1958	1959	1960	1961	1962 [1]
Bemis-Shutts	5,063	4,868	4,472	4,116	3,988
Chase-Silica	3,260	3,689	3,219	2,919	3,902
El Dorado	4,371	4,443	4,291	4,239	3,986
Genesco-Edwards	1,812	1,680	1,565	1,529	1,454
Gorham	1,499	1,421	1,311	1,238	1,196
Hall-Gurney	3,296	3,253	3,229	3,291	3,199
Interstate	644	1,152	993	979	1,043
Kismet	---	---	---	---	1,099
Kraft-Prusa	3,092	2,890	2,526	2,317	2,147
Lost Springs	495	1,704	1,914	2,350	1,848
Marcotte	1,779	1,596	1,424	1,258	1,163
Morel	1,477	1,354	1,299	1,239	1,227
Pleasant Prairie	254	1,369	1,839	1,719	1,676
Ray	1,353	1,363	1,289	1,306	1,322
Ritz-Canton	1,542	1,321	1,199	1,120	1,396
Spivey-Grabs-Basil	1,961	2,370	2,492	3,726	3,949
Trapp	3,366	3,120	2,752	2,542	2,439
Other fields	84,678	81,950	77,530	76,353	75,042
Total Kansas	119,942	119,543	113,344	112,241	112,076
Change in fields stocks [2]	---	---	+109	---	---
Total Kansas production [2]	119,942	119,543	113,453	112,241	112,076

[1] Preliminary figures.
[2] Bureau of Mines data.

Source: Kansas Geological Survey.

TABLE 16.—Production of crude petroleum in Louisiana, by districts and selected fields

(Thousand barrels)

District and field [1]	1958	1959	1960	1961	1962 [2]
Gulf Coast:					
Onshore: [3]					
Anse la Butte	1,669	1,787	1,660	1,565	1,600
Avery Island	2,588	2,696	3,097	2,985	2,714
Bateman Lake	2,835	3,171	2,941	3,538	2,835
Bay de Chene	1,583	1,894	2,197	2,272	2,541
Bay St. Elaine	3,158	3,965	4,720	5,596	8,198
Bayou Sale	2.258	2,961	3,613	5,387	6,677
Bully Camp	1,229	1,500	1,384	1,529	1,572
Caillou Island	10,856	15,062	16,694	17,634	19,828
Cox Bay	1,842	2,081	2,031	1,932	1,976
Delta Farms	3,313	3,675	2,923	2,885	3,018
Duck Lake	2,234	2,533	2,151	2.765	3,031
East & West White Lake	1,355	1,693	1,460	782	1,752
Erath	5,601	4,091	3,590	6,745	4,809
Garden Island	1,330	1,633	2,062	2,865	3,209
Golden Meadow	2,663	2,446	2,350	2,363	2,493
Grand Bay	1,230	3,113	4,008	3,568	5,613
Hackberry	5,002	4,992	4,850	4,413	5,791
Lafitte	2,684	3,253	3,442	3,563	4,236
Lake Barre	2,498	4,458	5,231	6,438	9,476
Lake Pelto	3,018	4,099	4,603	4,551	4,607
Lake Salvador	1,625	2,124	2,291	2,238	2,800
Lake Washington	9,599	10,902	10,863	10,618	10,621
Leeville	3,797	3,905	3,769	3,794	3,997
Little Lake	2,067	2,462	2,232	1,940	2,082
Main Pass Block 35	2,930	3,285	3,143	3,967	4,126
Paradis	2,223	2,554	2,375	2,701	2,453
Quarantine Bay	2,752	2,949	3,130	4,678	5,241
Romere Pass	2,795	2,797	2,618	3,086	2,925
South Pass Block 24	15,067	16,423	16,528	15,671	16,578
Timbalier Bay	8,558	10,220	11,695	11,860	14,124
Valentine	1,574	1,621	937	1,726	1,803
Venice	4,198	4,404	4,306	4,599	4,574
Vinton	1,688	1,729	1,656	1,622	1,801
Weeks Island	6,796	7,476	8,422	9,538	8,557
West Bay	4,176	4,957	5,282	5,945	7,432
West Cote Blanche	2,961	3,704	4,323	4,559	5,446
West Lake Verret	1,259	1,257	1,066	1,328	1,515
Other	100,073	116,205	135,770	134,115	153,752
Total Onshore	233,084	270,077	295,413	307,361	345,803
Offshore [3]					
Bay Marchand	8,421	6,093	9,858	16,723	17,233
Eugene Island	4,955	5,172	7,721	8,066	9,823
Grand Isle	5,759	7,568	9,606	11,227	13,743
Main Pass Block 69	6,917	7,417	7,305	7,227	8,592
Ship Shoal	1,524	1,814	2,247	3,771	3,478
South Pass Block (27)	3,579	5,620	7,274	8,980	11,585
Vermillion	----------	----------	----------	----------	2,154
West Delta Block	5,508	9,801	10,278	11,131	14,043
Other	2,611	3,520	3,683	3,400	7,214
Total Offshore	39,274	47,005	57,972	70,525	87,865
Total Gulf Coast	272,358	317,082	353,385	377,886	433,668
Northern:					
Caddo	7,066	6,334	6,050	5,638	5,704
Cotton Valley	3,277	2,804	1,850	6,678	3,430
Delhi	4,931	5,433	5,144	5,097	4,670
Haynesville	3,213	2,472	2,781	2,220	2,513
Lake St. John	2,072	1,842	1,569	2,923	2,046
Pendelton	----------	----------	----------	----------	2,022
Sligo	1,277	1,564	1,388	1,434	2.305
Other Northern	19,697	25,135	28,665	23,086	26,743
Total Northern	41,533	45,584	47.447	47,076	49,433
Total Louisiana [4]	313,891	362,666	400,832	424,962	483,101

---

[1] Breakdown for individual fields from the Oil and Gas Journal.

[2] Preliminary figures.

[3] Some fields include onshore and offshore.

[4] 1958-59, Bureau of Mines data; 1960-62, Louisana Conservation Department data.

TABLE 17.—Production of crude petroleum in Michigan, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Albion	-------	-------	2,080	3,188	2,854
Beaver Creek	227	340	225	(3)	(3)
Coldwater	636	642	585	467	341
Deep River	275	225	190	(3)	(3)
East Norwich	332	294	276	(3)	(3)
Kawkawlin	570	508	446	372	(3)
Kimball Lake	22	16	11	(3)	(3)
Pentwater	135	117	80	(3)	(3)
Pulaski	-------	-------	1,628	1,978	1,920
Reed City–East Reed City	566	514	408	(3)	(3)
Rose City	292	338	298	(3)	(3)
St. Helen	142	155	148	(3)	(3)
Scipio	445	1,331	3,514	6,090	5,157
Stony Lake	136	160	145	(3)	(3)
Other fields	5,530	5,799	5,865	6,806	6,845
Total Michigan [3]	9,308	10,439	15,899	18,901	17,117

[1] Based on Oil and Gas Journal data.
[2] Preliminary figures.
[3] Michigan Department of Conservation data.

TABLE 18.—Production of crude petroleum in Mississippi, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Baxterville	4,819	5,801	5,901	5,949	5,808
Bolton	1,260	1,369	1,457	1,136	1,127
Brookhaven	2,396	1,928	1,924	1,571	1,498
Bryan	-------	1,222	2,487	3,391	2,068
Cranfield	1,428	805	1,099	901	905
Diamond	959	1,040	1,166	924	751
Eucutta	1,571	1,533	1,363	1,261	1,151
Heidelberg	3,205	3,262	3,302	3,974	3,737
La Grange and South	1,621	1,755	1,453	1,471	1,322
Little Creek	1,440	5,460	5,669	6,431	5,384
Mallalieu	727	761	601	562	596
McComb	-------	-------	2,533	2,949	4,383
Pistol Ridge Maxie	1,185	1,207	1,000	651	736
Raleigh	-------	2,138	2,157	1,820	1,392
Soso	4,204	4,695	3,901	3,418	2,998
Tinsley	3,800	3,421	3,234	2,991	2,835
Yellow Creek	1,360	1,292	1,170	1,222	1,492
Other fields	9,537	11,931	11,256	14,066	16,288
Total Mississippi	39,512	49,620	51,673	54,688	54,471

[1] Based on Oil and Gas Journal data adjusted to State total.
[2] Preliminary figures.

TABLE 19.—Production of crude petroleum in Montana, by fields

(Thousand barrels)

Field	1958	1959	1960	1961	1962 [1]
Big Wall	218	204	264	401	363
Bowes	282	333	280	241	188
Cabin Creek	4,255	4,350	4,470	4,198	3,854
Cat Creek	170	151	181	238	220
Cut Bank	2,210	2,004	2,078	2,036	1,912
Elk Basin	3,143	4,065	2,718	2,690	3,694
Glendive	732	505	456	519	458
Kevin-Sunburst	969	833	744	666	614
Pine	5,346	4,832	5,112	5,212	4,726
Pondera	563	521	505	496	463
Poplar	4,641	3,775	3,232	2,386	1,856
Reagan	166	175	190	153	211
Sumatra	1,600	2,013	2,145	2,463	2,332
Other fields	3,662	6,096	7,865	9,207	10,757
Total Montana [2]	27,957	29,857	30,240	30,906	31,648

[1] Preliminary figures.
[2] Montana Oil & Gas Conservation Commission data.

TABLE 20.—Production of crude petroleum in New Mexico, by districts and fields

(Thousand barrels)

District and field [1]	1958	1959	1960	1961	1962 [2]
Southeast:					
Bagley	1,312	1,188	1,156	1,071	974
Caprock-East	5,216	6,581	5,525	5,881	5,722
Crossroad	1,402	1,426	1,480	1,941	2,028
Denton	7,968	7,141	6,293	5,841	5,310
Dollarhide-West	2,510	1,855	1,607	1,285	965
Drinkard	1,738	1,597	1,465	1,375	1,504
Eunice-Monument	11,674	7,896	7,632	6,048	6,741
Fowler	787	711	712	680	632
Gladiola	7,324	7,046	6,031	5,901	4,763
Grayburg-Jackson	1,318	1,554	1,707	1,598	1,422
Hobbs	3,248	3,399	3,357	3,272	3,230
Langlie-Mattix	1,996	2,289	2,955	2,696	2,121
Lovington-East	2,466	2,337	2,137	1,988	1,896
Maljamar	2,449	2,730	2,820	3,008	2,950
Moore	1,042	1,014	954	863	814
Saunders-South	1,781	2,476	2,306	1,993	1,502
Vacuum	3,348	3,709	4,061	4,691	6,291
Warren	1,604	1,194	1,095	944	866
Other fields	30,781	37,304	37,681	45,797	48,378
Northwest	8,551	12,245	16,406	15,680	10,599
Total New Mexico [3]	98,515	105,692	107,380	112,553	108,708

[1] Based on Oil and Gas Journal data.
[2] Preliminary figures.
[3] New Mexico Oil and Gas Conservation Commission data.

TABLE 21.—Production of crude petroleum in Oklahoma, by fields

(Thousand barrels)

Field[1]	1958	1959	1960	1961	1962[2]
Allen	1,590	1,676	1,525	1,403	1,390
Beebe	625	606	697	749	814
Bradley	2,741	2,898	2,631	3,048	3,273
Burbank	14,548	14,463	15,676	15,275	14,290
Cache Creek	827	910	1,041	1,231	893
Cement	4,405	4,222	3,836	4,038	3,533
Cumberland	1,474	1,407	1,219	1,213	1,142
Cushing	2,702	2,585	2,515	2,537	2,629
Davenport	959	855	613	654	555
Dover-Hennessey	-----	-----	-----	4,841	8,945
Doyle	2,421	2,241	1,798	1,671	1,313
Elk City	2,806	2,113	1,741	1,398	937
Eola-Robberson	3,188	3,863	3,470	3,624	3,444
Fitts	800	910	950	983	930
Garber	826	876	761	595	657
Glenn Pool	2,773	3,164	3,200	3,368	3,490
Golden Trend	13,106	10,627	11,071	10,202	10,730
Healdton	2,331	2,256	2,154	2,353	2,513
Hewitt	3,084	2,977	2,938	2,989	2,550
Holdenville-East	476	412	-----	-----	1,210
Hoover-Northwest	2,417	2,039	1,329	802	820
Joiner City	-----	395	1,561	2,054	1,980
Knox	1,045	941	2,206	2,039	1,390
Lincoln	-----	-----	-----	424	1,395
Loco	1,372	1,290	1,309	1,517	1,738
Lucien	743	749	710	699	721
Moore-West	2,553	1,527	1,275	1,294	1,066
Naval Reserve	1,498	1,667	2,353	2,456	2,367
Oklahoma City	3,290	3,050	2,851	2,617	2,381
Olympic	1,341	1,101	967	787	650
Payson-East	300	423	893	1,421	2,005
Seminole:					
Bowlegs	619	665	905	1,125	1,240
Little River	430	390	388	354	339
St. Louis	1,410	1,379	1,422	1,449	1,440
Seminole	876	797	696	666	726
Sho-Vel-Tum	25,823	25,175	24,227	24,510	24,350
West Edmond	1,153	1,013	1,407	1,212	1,179
Yale-Quay	1,927	1,700	1,254	979	796
Other fields	92,220	94,728	89,324	84,504	86,795
Total Oklahoma	200,699	198,090	192,913	193,081	198,616

[1] Based on Oil and Gas Journal data adjusted to Bureau of Mines total.
[2] Preliminary figures.

TABLE 22.—Production of crude petroleum in Texas, by districts and selected fields

(Thousand barrels)

District [1] and field [2]	1958	1959	1960	1961	1962 [3]
Gulf Coast:					
Amelia	576	637	706	1, 283	1, 726
Anahuac	3, 301	4, 066	3, 484	3, 489	3, 368
Chocolate Bayou	1, 008	3, 836	3, 953	3, 657	3, 530
Conroe	5, 998	6, 017	5, 162	5, 375	4, 884
Dickinson-Gillock	2, 601	3, 125	2, 872	3, 056	2, 952
Goose Creek	2, 751	2, 633	2, 466	2, 268	2, 500
Hastings	5, 712	9, 290	7, 786	7, 744	7, 431
High Island	3, 992	4, 112	4, 906	5, 334	6, 998
Hull and Merchant	4, 708	3, 919	3, 616	3, 498	3, 756
Katy, North	503	9, 232	9, 112	9, 204	10, 271
Liberty, South	5, 592	3, 548	3, 528	2, 942	3, 065
O'Connor, Tom	5, 106	6, 460	6, 532	6, 432	6, 841
Old Ocean	4, 628	5, 129	4, 180	4, 261	3, 819
Oyster Bayou	------------	2, 145	1, 812	1, 769	1, 714
Pierce Junction	5, 310	3, 818	2, 928	2, 564	2, 168
Thompson	8, 544	5, 673	5, 188	5, 298	5, 135
Village Mills	1, 683	2, 081	1, 562	1, 683	1, 819
Webster	4, 915	6, 859	5, 802	5, 629	5, 345
West Columbia	2, 783	3, 032	3, 079	2, 849	2, 759
West Ranch	3, 731	4, 729	4, 101	4, 295	4, 492
Other Gulf Coast	105, 944	92, 659	84, 393	86, 591	87, 570
Total Gulf Coast	179, 386	183, 000	167, 168	169, 221	172, 143
East Texas:					
East Texas Field	52, 593	53, 691	48, 704	48, 583	45, 180
Hawkins	8, 782	9, 845	9, 173	8, 897	8, 437
New Hope	2, 450	2, 752	2, 595	4, 206	3, 740
Quitman	1, 776	2, 568	2, 994	3, 203	2, 757
Talco	2, 888	4, 284	3, 654	4, 238	4, 551
Van & Van Shallow	4, 702	5, 312	4, 896	4, 803	4, 657
Other East Texas	33, 109	27, 951	29, 208	28, 851	30, 142
Total East Texas	106, 300	106, 403	101, 224	102, 781	99, 464
Central Texas:					
Darst Creek	3, 475	3, 336	4, 024	2, 414	3, 013
Luling	2, 737	2, 715	2, 319	2, 081	2, 086
Other Central Texas	10, 175	9, 334	10, 127	11, 556	9, 301
Total Central Texas	16, 387	15, 385	16, 470	16, 051	14, 400
South Texas:					
Aqua Dulce-Stratton	5, 249	5, 222	5, 039	3, 673	5, 610
Borregos	1, 975	2, 632	2, 399	4, 105	4, 479
Kelsey	2, 130	2, 726	2, 269	2, 925	2, 744
Plymouth	4, 039	3, 847	3, 833	3, 548	2, 910
Portilla	1, 797	1, 353	2, 085	2, 239	2, 158
Seeligson	7, 932	14, 918	10, 918	19, 342	20, 518
Sun	834	1, 261	1, 571	1, 563	1, 639
Tijerina-Canales	1, 465	2, 242	2, 211	2, 114	2, 237
White Point	2, 194	2, 477	2, 137	2, 119	2, 063
Other South Texas	41, 875	34, 381	35, 862	27, 029	26, 955
Total South Texas	69, 490	71, 059	68, 324	68, 657	71, 313
North Texas	120, 176	120, 307	117, 302	116, 244	117, 924
Panhandle	38, 587	36, 750	38, 570	38, 772	37, 562

See footnotes at end of table.

TABLE 22.—Production of crude petroleum in Texas, by districts and selected fields—Continued

(Thousand barrels)

District[1] and field[2]	1958	1959	1960	1961	1962[3]
West Texas:					
Adair	1,207	1,834	1,827	1,808	1,704
Andector	2,844	3,427	2,942	2,505	2,546
Anton-Irish-Anton	1,610	1,909	1,741	1,701	2,868
Bakke	1,660	3,050	4,161	4,751	5,448
Block 31	5,716	5,809	5,821	5,800	5,420
Cedar Lake	871	1,075	1,152	1,346	1,551
Cogdell	3,919	6,047	5,103	3,219	4,805
Cowden, South and Foster	11,006	14,086	13,820	14,102	13,296
Diamond M	5,220	7,627	6,451	5,711	5,470
Dollarhide	2,989	3,008	2,656	2,402	2,596
Dune	2,447	4,547	4,856	4,287	5,234
Emma and Tripple "N"	3,934	5,961	5,750	5,743	5,252
Fort Chadborne	3,964	3,390	2,742	2,598	2,557
Fuhrman	3,470	4,226	4,135	3,793	3,278
Fullerton	4,821	6,493	6,060	6,187	6,397
Garza	1,758	2,045	1,770	1,696	1,531
Goldsmith	20,422	20,164	20,956	19,070	16,034
Good	671	1,202	1,391	1,393	1,862
Headlee	2,635	3,469	5,003	5,490	3,456
Hendrick	1,966	2,283	2,151	1,815	1,602
Howard-Glasscock	5,901	6,499	6,312	6,857	6,894
Iatan-East and North	1,570	1,847	1,807	1,811	2,287
Jameson	2,727	2,994	2,569	2,329	2,173
Jo-Mill	2,891	3,784	2,970	2,632	2,250
Jordan	2,498	3,024	2,671	2,591	2,458
Kelly Snyder	16,339	20,056	14,929	16,894	16,139
Kermit	4,892	5,271	6,143	5,290	4,834
Keystone	4,894	5,963	5,368	7,456	5,528
Levelland	5,402	6,346	5,879	5,787	3,809
McCamey	2,054	1,986	1,971	1,944	2,071
McElroy	7,610	9,810	8,928	8,407	7,957
Mabee	873	1,697	1,544	1,701	1,818
Magutex	1,524	2,501	2,170	2,128	2,009
Means	4,250	4,468	3,546	3,753	4,623
Midland Farms	4,435	5,829	4,685	5,045	5,504
Pegasus	3,159	3,998	3,838	4,737	5,114
Penwell	1,833	2,761	3,123	2,736	2,766
Prentice	3,629	4,377	3,654	3,457	3,220
Robertson	1,877	3,214	3,174	3,639	3,650
Russell	4,325	5,422	4,927	4,999	4,491
Salt Creek	2,199	3,879	3,264	3,181	3,056
Sand Hills	4,422	5,189	4,687	4,749	7,339
Seminole	2,442	3,782	2,558	3,247	2,425
Shafter Lake	2,045	2,576	2,398	2,323	2,263
Sharon Ridge	2,174	2,384	2,352	2,255	2,138
Slaughter	7,100	9,062	8,553	8,615	8,658
Sprayberry Trend	12,277	13,558	12,131	10,801	9,400
TXL	4,547	6,759	9,243	6,280	6,677
University	2,840	4,121	3,830	4,160	4,673
Vealmoor-East	1,721	2,024	1,778	1,692	1,606
Waddell	1,786	2,376	2,255	2,165	1,815
Ward-Estes	14,529	14,616	15,032	17,095	19,216
Wasson	9,496	12,692	11,711	11,212	12,268
Welch	1,346	2,284	2,098	1,928	2,134
World	1,673	1,822	1,677	1,956	1,549
Yarbrough	1,151	1,311	1,118	1,014	3,991
Yates	5,427	6,372	5,475	4,427	5,154
Other West Texas	166,852	140,768	137,565	150,755	146,838
Total West Texas	409,840	439,074	418,421	427,465	423,702
Total Texas[4]	940,166	971,978	927,479	939,191	936,508

[1] See section on Districts under General Summary.
[2] Breakdown of individual fields from Oil and Gas Journal.
[3] Preliminary figures.
[4] As reported by the companies to the Bureau of Mines.

TABLE 23.—Production of crude petroleum in Wyoming, by fields

(Thousand barrels)

Field [1]	1958	1959	1960	1961	1962 [2]
Beaver Creek	2,391	2,389	2,782	3,079	2,200
Big Muddy	1,781	2,260	2,223	1,914	1,709
Big Sand Draw	2,586	2,489	1,982	1,731	1,443
Bonanza	4,801	3,497	2,695	1,896	1,070
Byron Garland	6,474	7,820	7,907	7,826	7,735
Coyotte Creek	-----	514	815	2,287	2,390
Donkey Creek	1,390	1,852	2,567	1,700	1,246
Elk Basin	15,518	18,214	18,803	20,603	24,431
Fiddler Creek	77	724	1,217	1,676	2,025
Four Bear	-----	1,744	3,083	3,492	3,104
Frannie	2,647	2,812	2,718	2,567	1,958
Gebo	1,067	1,163	1,226	1,148	915
Glenrock-South	2,711	2,509	2,017	1,975	1,826
Grass Creek	3,899	4,619	4,543	4,602	5,025
Hamilton Dome	8,577	9,294	12,045	10,568	9,180
Lance Creek	1,338	1,222	1,188	800	780
Little Buffalo	2,105	2,250	2,039	2,512	2,025
Lost Soldier-Bairoil	6,407	6,135	5,989	5,666	3,031
Murphy Dome	2,532	2,909	3,001	2,550	2,240
Oregon Basin	4,719	5,183	5,234	5,875	6,330
Patrick Draw	-----	-----	2,339	8,117	6,590
Raven Creek	-----	-----	-----	1,700	3,075
Salt Creek	8,486	7,500	9,515	9,235	7,073
Steamboat Butte	3,259	3,188	2,901	3,012	3,025
Sussex Meadow	5,564	6,955	6,387	5,196	3,755
Wertz	2,280	2,233	2,273	2,242	2,250
Winkleman Dome	3,044	3,353	3,114	2,726	2,515
Other fields	21,919	23,222	23,307	25,242	36,221
Total Wyoming [3]	115,572	126,050	133,910	141,937	145,167

[1] Breakdown for individual fields from the Oil and Gas Journal.
[2] Preliminary figures.
[3] Bureau of Mines data.

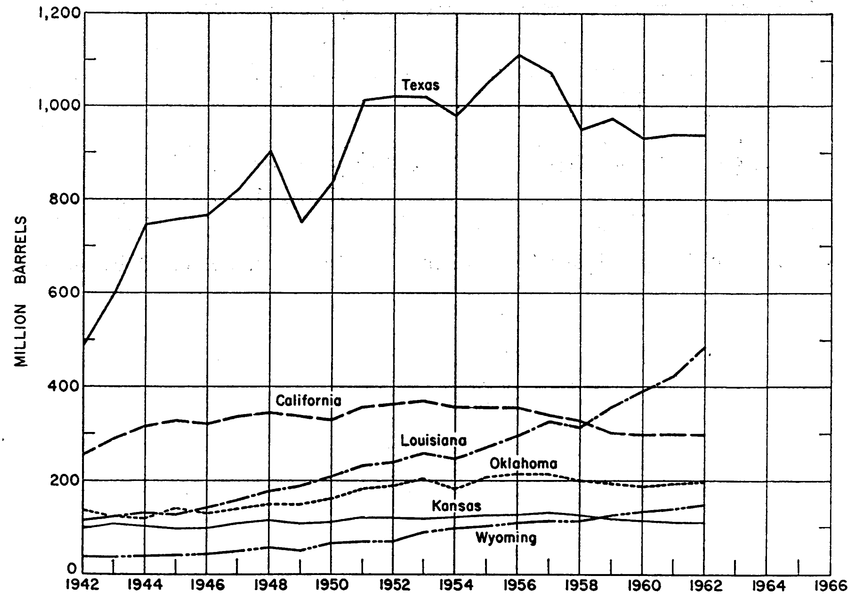


FIGURE 3.—Production of crude petroleum in the United States, 1942–62, by principal producing States.

WELLS

A total of 43,779 wells were drilled in 1962, a slight decline from a year ago, but the proportion of dry holes drilled to the total declined from 39.0 percent in 1961 to 38.1 percent in 1962. Service wells are not included in this total of wells drilled.

Drilling activity declined sharply in the midcontinent area, 1,466 fewer wells were drilled in 1962. Louisiana reported an increase of 945, the largest increase in drilling for the year and was followed by California with an increase of 516.

A total of 596,385 oil wells were reporting as producing an average daily production of 12.3 barrels as of December 31, 1962, compared with 594,917 wells producing at a daily average rate of 12.1 barrels at the end of 1961.

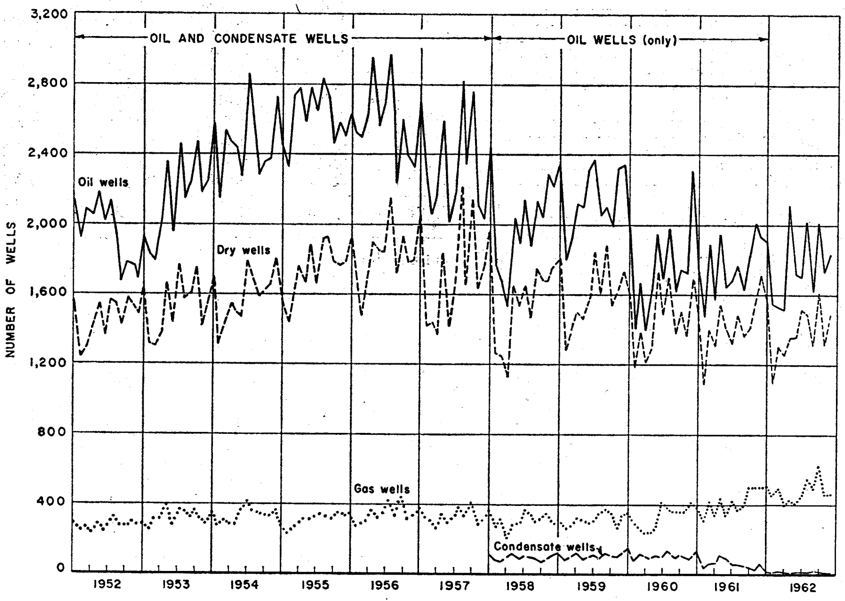


FIGURE 4.—Wells drilled for oil and gas in the United States, 1952–62, by months.

TABLE 24.—Wells drilled for oil and gas in the United States, by months

Wells	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
													Number	Percent
1961:														
Oil	1,745	1,476	1,887	1,576	1,942	1,641	1,675	1,764	1,625	1,825	2,012	1,933	21,101	48.1
Condensate	135	36	63	67	108	93	60	60	51	34	19	23	749	1.7
Gas	389	311	416	341	432	336	417	373	395	503	502	500	4,915	11.2
Dry	1,512	1,095	1,401	1,311	1,541	1,410	1,318	1,480	1,360	1,407	1,557	1,714	17,106	39.0
Total	3,781	2,918	3,767	3,295	4,023	3,480	3,470	3,677	3,431	3,769	4,090	4,170	43,871	100.0
1962:														
Oil	1,912	1,544	1,529	1,514	2,118	1,722	1,699	2,018	1,624	2,010	1,729	1,830	21,249	48.5
Condensate	14	9	17	13	8	10	12	10	16	13	1	------	123	0.3
Gas	515	450	489	394	428	402	451	551	486	628	463	468	5,725	13.1
Dry	1,560	1,100	1,309	1,259	1,357	1,359	1,522	1,481	1,319	1,615	1,321	1,480	16,682	38.1
Total	4,001	3,103	3,344	3,180	3,911	3,493	3,684	4,060	3,445	4,266	3,514	3,778	43,779	100.0

Source: Oil and Gas Journal.

TABLE 25.—Wells drilled for oil and gas in the United States, by States and districts

State and district	1961					1962				
	Oil	Condensate	Gas	Dry	Total	Oil	Condensate	Gas	Dry	Total
Alabama	35			9	44	25			15	40
Alaska	26		5	17	48	6		5	29	40
Arizona	2		1	20	23	1		9	44	54
Arkansas	215		43	286	544	117		48	203	368
California	1,410		157	428	1,995	1,867		163	481	2,511
Colorado	93	2	114	453	662	143	1	88	525	757
Florida				8	8	1			3	4
Georgia				1	1				1	1
Illinois	725		13	824	1,562	727		11	768	1,506
Indiana	274		6	506	786	199		7	470	676
Kansas	2,238	2	324	1,774	4,338	1,779	2	230	1,715	3,726
Kentucky	380		238	745	1,363	663		223	692	1,578
Louisiana:										
Gulf Coast	1,020	126	206	861	2,213	1,110	2	366	1,096	2,574
Northern	725	24	276	796	1,821	1,079	6	350	970	2,405
Total Louisiana	1,745	150	482	1,657	4,034	2,189	8	716	2,066	4,979
Michigan	200		68	478	746	129		71	497	697
Mississippi	201	24	18	331	574	199	6	20	378	603
Missouri				38	38				11	11
Montana	167		4	236	407	177		19	224	420
Nebraska	355		2	647	1,004	173		5	511	689
Nevada	1			14	15				7	7
New Mexico:										
West	227	2	406	151	786	117	1	396	129	643
East	678	3	29	310	1,020	650	1	23	324	998
Total New Mexico	905	5	435	461	1,806	767	2	419	453	1,641
New York	230		16	28	274	148		43	51	242
North Carolina									3	3
North Dakota	131			127	258	104			123	227
Ohio	565		194	290	1,049	568		261	284	1,113
Oklahoma	2,820	79	514	1,657	5,070	2,605	95	477	1,379	4,556
Oregon				2	2				6	6
Pennsylvania	237		212	77	526	210		271	110	591
South Dakota				6	6				11	11
Tennessee	5		8	60	73	2		3	38	43
Texas:										
Gulf Coast	743	172	273	816	2,004	824	1	466	874	2,165
West	2,464	58	107	932	3,561	2,531	1	123	839	3,494
East	632	60	31	430	1,153	619		99	374	1,092
Other districts	3,717	189	661	2,974	7,541	3,958		856	2,732	7,546
Total Texas	7,556	479	1,072	5,152	14,259	7,932	2	1,544	4,819	14,297
Utah	90	3	35	124	252	89	3	50	141	283
Virginia			2		2			10	7	17
Washington				12	12				8	8
West Virginia	118		857	126	1,101	167		952	142	1,261
Wisconsin				6	6					
Wyoming	377	5	95	506	983	262	4	80	467	813
Total United States	21,101	749	4,915	17,106	43,871	21,249	123	5,725	16,682	43,779

Source: Oil and Gas Journal.

TABLE 26.—Producing oil wells in the United States and average production per well per day, by States

State	Producing oil wells			
	1961		1962[1]	
	Approximate number of producing oil wells, Dec. 31	Average production per well per day (barrels)[2]	Approximate number of producing oil wells, Dec. 31	Average production per well per day (barrels)[2]
Alabama	418	47.6	449	47.3
Alaska	45	559.2	52	573.7
Arkansas	6,330	12.6	5,918	12.3
California	38,184	21.6	39,265	21.0
Colorado	2,023	63.4	2,110	56.3
Illinois	31,911	6.6	30,174	6.8
Indiana	5,679	5.8	5,607	5.7
Kansas	40,933	7.6	46,750	7.0
Kentucky	19,857	2.5	19,448	2.5
Louisiana:				
Gulf Coast	12,843	82.6	13,813	89.1
Rest of State	11,897	10.6	12,569	11.1
Total Louisiana	24,740	47.1	26,382	51.8
Michigan	4,301	12.0	4,282	10.9
Mississippi	2,819	50.7	2,560	55.5
Montana	3,342	24.0	3,692	24.7
Nebraska	1,860	38.9	1,764	37.6
New Mexico:				
Southeastern	13,630	20.1	14,333	19.2
Northwestern	1,665	27.6	1,769	16.9
Total New Mexico	15,295	20.8	16,102	19.0
New York	17,829	.2	13,537	.3
North Dakota	1,683	41.4	1,794	39.7
Ohio	16,682	.9	16,867	.8
Oklahoma	79,387	6.7	80,799	6.8
Pennsylvania	63,576	.2	59,673	.2
Texas:[3]				
Gulf Coast	19,176	24.4	19,491	24.4
East Texas proper	19,488	6.9	19,424	6.4
West Texas	64,158	18.5	65,236	17.9
Other districts	93,574	8.7	93,508	8.7
Total Texas	196,396	13.2	197,659	13.0
Utah	795	114.0	852	103.1
West Virginia	12,762	.6	12,880	.7
Wyoming	7,880	50.6	7,581	51.5
Other States	[4] 190	13.4	[5] 188	12.2
Total United States	594,917	12.1	596,385	12.3

[1] Preliminary figures.

[2] Based on the average number of wells during the year.

[3] Division of the Texas Railroad Commissions.

[4] Arizona, 5; Florida, 11; Missouri, 116; Nevada, 4; South Dakota, 19; Tennessee, 30; Virginia, 5; Washington, 0.

[5] Arizona, 4; Florida, 11; Missouri, 105; Nevada, 4; South Dakota, 19; Tennessee, 40; Virginia, 5; Washington, 0.

CONSUMPTION AND DISTRIBUTION

The total demand for crude oil in the United States in 1962 was 8,438,000 barrels daily, compared with 8,215,000 barrels in 1961. The demand for domestic crude oil (7,313,000 barrels daily) increased 2.1 percent and the demand for foreign crude oil (1,125,000 barrels daily) was 7.0 percent above the 1961 level.

Foreign crude oil supplied 13.3 percent of the total crude-oil requirements in 1962, compared with 12.8 percent a year ago.

TABLE 27.—Runs to stills of crude petroleum in the United States in 1962, by districts and month [1]

(Thousand barrels)

District [2]	January	February	March	April	May	June	July	August	September	October	November	December	Total
East Coast:													
Domestic	17,258	16,488	16,401	15,740	12,872	12,027	12,591	12,031	11,822	12,657	12,734	14,384	167,005
Foreign	19,732	17,635	19,642	16,658	20,037	21,701	21,715	21,795	21,201	19,276	19,671	20,155	239,218
Total East Coast	36,990	34,123	36,043	32,398	32,909	33,728	34,306	33,826	33,023	31,933	32,405	34,539	406,223
Appalachian No. 1:													
Domestic	2,770	2,532	2,864	2,611	2,359	2,760	2,975	2,458	2,832	2,739	2,466	2,827	32,193
Foreign	294	290	402	259	459	469	368	393	441	347	395	413	4,530
	3,064	2,822	3,266	2,870	2,818	3,229	3,343	2,851	3,273	3,086	2,861	3,240	36,723
Appalachian No. 2	2,977	2,643	2,965	2,548	3,189	2,975	3,007	3,295	3,395	2,645	2,243	3,165	35,047
Indiana, Illinois, Kentucky, etc.:													
Domestic	48,300	43,318	44,965	43,546	44,187	45,654	45,776	41,897	42,126	43,668	42,526	45,866	531,829
Foreign	1,320	1,158	1,135	989	1,071	1,253	1,063	1,496	1,388	1,371	1,230	1,346	14,820
Total Indiana, Illinois, Kentucky, etc	49,620	44,476	46,100	44,535	45,258	46,907	46,839	43,393	43,514	45,039	43,756	47,212	546,649
Minnesota, Wisconsin, North Dakota, and South Dakota:													
Domestic	2,533	2,065	2,225	2,250	2,248	2,363	2,353	2,118	1,621	2,193	2,136	2,132	26,237
Foreign	1,676	1,742	1,851	1,391	1,049	1,596	1,725	1,989	1,605	1,952	1,755	2,068	20,399
Total Minnesota, Wisconsin, North Dakota, and South Dakota	4,209	3,807	4,076	3,641	3,297	3,959	4,078	4,107	3,226	4,145	3,891	4,200	46,636
Oklahoma, Kansas, etc	23,203	21,217	21,971	20,689	23,201	22,850	24,142	23,776	22,336	22,211	22,313	22,774	270,683
Texas Inland	9,206	8,512	8,862	9,293	9,435	9,905	9,953	10,103	9,359	9,574	9,351	9,426	112,979
Texas Gulf Coast:													
Domestic	61,680	56,546	58,972	58,575	62,296	60,649	61,118	63,706	57,762	60,987	59,599	62,951	724,841
Foreign	---------	---------	82	---------	19	---------	31	53	9	---------	9	---------	203
Total Texas Gulf Coast	61,680	56,546	58,972	58,575	62,296	60,649	61,118	63,706	57,762	60,987	59,599	62,951	724,841
Louisiana Gulf Coast:													
Domestic	23,237	20,602	21,862	20,439	22,449	22,626	22,939	22,587	24,033	23,120	22,728	22,682	269,304
Foreign	---------	20	41	146	60	119	149	109	27	126	266	103	1,166
Total Louisiana Gulf Coast	23,237	20,622	21,903	20,585	22,509	22,745	23,088	22,696	24,060	23,246	22,994	22,785	270,470
Arkansas, Louisiana Inland, etc	3,131	2,992	3,594	3,531	3,715	3,526	3,692	3,719	3,362	3,742	3,527	3,622	42,153
New Mexico	693	658	846	845	848	843	868	863	822	598	701	848	9,433

Rocky Mountain:												
Domestic	9,539	8,641	8,290	8,156	9,030	9,474	9,879	10,074	9,877	9,450	9,010	9,234	110,654
Foreign	---------	1	1	16	15	4	6	7	5	15	77	179	326
Total Rocky Mountain	9,539	8,642	8,291	8,172	9,045	9,478	9,885	10,081	9,882	9,465	9,087	9,413	110,980
West Coast:													
Domestic	27,202	25,016	26,922	26,518	27,107	27,853	28,416	27,755	27,614	27,641	26,964	28,663	327,671
Foreign	10,526	9,889	10,177	8,761	10,656	10,135	11,702	12,357	11,035	11,761	11,333	10,811	129,143
Total West Coast	37,728	34,905	37,099	35,279	37,763	37,988	40,118	40,112	38,649	39,402	38,297	39,474	456,814
otal United States:													
Domestic	231,729	211,230	220,657	214,741	222,917	223,505	227,678	224,329	216,952	221,225	216,289	228,574	2,659,826
Foreign	33,548	30,735	33,331	28,220	33,366	35,277	36,759	38,199	35,711	34,848	34,736	35,075	409,805
Grand total: 1962	265,277	241,965	253,988	242,961	256,283	258,782	264,437	262,528	252,663	256,073	251,025	263,649	3,069,631
1961	259,349	236,756	250,964	234,577	248,973	239,579	256,974	262,109	239,280	253,534	246,142	258,921	2,987,158
Daily average 1962	8,557	8,642	8,193	8,099	8,267	8,626	8,530	8,469	8,422	8,260	8,367	8,505	8,410

[1] Preliminary figures.

[2] Where no breakdown is shown, runs were all domestic crude.

Runs to Stills.—Refiners processed 8,410,000 barrels of crude oil daily in 1962, using daily 7,287,000 barrels of domestic crude oil and 1,223,000 barrels of foreign-origin crude oil. Compared with 1961, total crude runs to stills increased 226,000 barrels per day; domestic crude runs, 152,000 barrels daily; and foreign crude runs, 74,000 barrels daily.

Distribution.—The Bureau of Mines collects data on receipts of domestic and foreign crude petroleum at refineries in the United States. These receipts include the crude runs to stills, a small quantity used as refinery fuel, and any increase in crude stocks at refineries. Classification of receipts, by State of origin, shows receipts from local production (intrastate), receipts from other States (interstate), and receipts of imported crude. Classification by method of transportation indicates the final receipts by water, pipeline, and tank car and truck. Receipts of domestic crude by water usually were moved by pipeline from the point of production to the point of water shipment.

Receipts of domestic and foreign crude petroleum at refineries totaled 3,070.8 million barrels in 1962; foreign crude represented 13.3 percent of this total. The refineries processed 3,069.6 million barrels and reported 1.0 million barrels used for refinery fuel and losses, the difference was 0.2 million barrels added to stocks.

Refineries received 74.2 percent of their supply of crude oil by pipeline, 24.4 percent by water, and the remainder by tank cars and trucks.

The major waterborne shipments were from the gulf coast to the east coast and between States in the gulf-coast districts. There are also interstate and intrastate shipments by water on the west coast and Mississippi River.

All foreign crude receipts into the east coast and the major part of those into the gulf coast are received by water. Refineries in District II, which comprises the Great Lakes and the midcontinent areas, receives most of their foreign crude by pipeline from Canada; however, some is barged up the river from gulf-coast ports where it arrived by tanker. Very little foreign crude is processed at refineries in the Rocky Mountain States; such crude as is used arrives at the refineries by pipeline and rail from Canada. West coast refiners received 80.5 percent of their foreign crude supply by water, the rest was received by pipeline at refineries near the Canadian border.

Demand by States of Origin.—Distribution of domestic crude oil by refining States and districts can be analyzed from receipts of crude oil at refineries. When long distance shipments are involved, various crudes may be mixed in transit or storage, and identification by origin may be only approximate.

TABLE 28.—**Receipts of domestic and foreign crude petroleum at refineries in the United States**

(Million barrels)

Method of transportation	1958	1959	1960	1961	1962 [1]
By water:					
Intrastate	141.4	134.1	125.8	136.0	140.9
Interstate	233.7	242.7	261.6	268.3	277.6
Foreign	313.4	316.8	330.0	317.1	330.2
Total by water	688.5	693.6	717.4	721.4	748.7
By pipeline:					
Intrastate	1,208.3	1,282.8	1,291.6	1,286.1	1,333.4
Interstate	808.3	868.5	857.4	871.9	865.8
Foreign	30.4	33.4	40.6	64.1	79.7
Total by pipeline	2,047.0	2,184.7	2,189.6	2,222.1	2,278.9
By tank cars and trucks:					
Intrastate	27.6	31.8	33.9	34.9	36.9
Interstate	9.2	9.2	10.1	8.1	6.2
Foreign	------	------	------	0.5	0.1
Total by tank cars and trucks	36.8	41.0	44.0	43.5	43.2
Grand total	2,772.3	2,919.3	2,951.0	2,987.0	3,070.8

[1] Preliminary figures.

TABLE 29.—Refinery receipts of domestic crude oil by States and districts, 1962

(Thousands of barrels)

Receiving State and district	Total domestic receipts	Intrastate receipts	Interstate receipts from—																		
			Ala. Miss.	Ark.	Calif. Nev. Alaska	Colo.	N.Y. Fla.	Ill.	Ind. Mich.	Kans.	Ohio Ky.	La.	Mont.	Nebr. N. Dak. and S. Dak.	New Mex.	Okla.	Texas	Utah	W. Va.	Wyo.	Total
Delaware, Massachusetts, Rhode Island	14,650											10,020					4,630				14,650
Florida, Georgia, South Carolina, Virgina	3,827		2,668									828					331				3,827
Maryland	847		599									248									847
New Jersey	51,845		884				430					26,117					24,194	220			51,845
New York: East																					
West	14,268							1,376					4,035			5,275	3,582				14,268
Pennsylvania: East	94,023		6,165									31,542					56,316				94,023
West	15,626	6,004				1,124	1,807	242			1,102		1,888	918		956			1,585		9,622
West Virginia	2,348	1,546									802										802
Total District 1	197,434	7,550	10,316			1,124	2,237	1,618			1,904	68,755	5,923	918		6,231	89,053	220	1,585		189,884
Illinois	205,998	31,305				1,497			962	10,532		1,928	398	1,966	14,856	29,997	97,324	2,144		13,089	174,693
Indiana	150,355	1,376				5,904		7,162	517	19,577	27		8,794	11,759	8,584	32,955	22,009			31,691	148,979
Kansas	114,093	88,427				4,643								845	7,928	9,147	2,752			351	25,666
Kentucky, Tennessee	43,002	21,381	3,760	495					2,025			13,739					117			1,485	21,621
Michigan	41,662	17,320				164		2,460		3			96	414			8,623			12,582	24.342
Minnesota, Wisconsin	10,153												583	7,301						2,269	10,153
Missouri	22,608									186					10,993	1,918	4,853			4,658	22,608
Nebraska	936																			936	936
North Dakota	16,062	16,062																			
Ohio: East	35,026	3,016				594		27,284		232		597	1,539	172		1				1,591	32,010
West	90,879	26	897	1,420		3,839		12,334	416	29		16,542		3,267	683	5,874	43,501			2,051	90,853
Oklahoma	133.331	102,072				592				8,323				41	1,444		17,358	3,501			31,259
Total District 2	864,105	280,985	4,657	1,915		17,233		49,240	3,920	38,882	27	32,806	11,410	25,765	44,488	79,892	196,537	5,645		70,703	583,120
Alabama, Mississippi	12,152	9,963	1,894									295									2,189
Arkansas	27,188	26,550										638									638
Louisiana	271,912	200,528	30,227	6,832												33	34,292				71,384
New Mexico	9,519	9,519																			
Texas	838,257	626,794	2,032									151,675			47,596	6,520		3,640			211,463
Total District 3	1,159,028	873,354	34,153	6,832								152,608			47,596	6,553	34,292	3,640			285,674

Colorado	13,361	1,066	------	------	------	------	------	------	------	------	------	------	1,710	54	154	------	------	------	------	10,377	12,295
Montana	27,775	9,353	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	18,422	18,422
Utah	30,775	6,060	------	------	10	18,319	------	------	------	------	------	------	------	------	54	------	------	------	------	6,332	24,715
Wyoming	39,091	37,544	------	------	------	1,545	------	------	------	------	------	------	------	2	------	------	------	------	------	------	1,547
Total District 4	111,002	54,023	------	------	10	19,864	------	------	------	------	------	------	1,710	56	208	------	------	------	------	35,131	56,979
California	324,364	295,290	------	------	5,772	------	------	------	------	------	------	269	------	------	7,036	------	272	15,725	------	------	29,074
Washington, Oregon, Hawaii	4,958	------	------	------	4,958	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	4,958
Total District 5	329,322	295,290	------	------	10,730	------	------	------	------	------	------	269	------	------	7,036	------	272	15,725	------	------	34,032
United States, total	2,660,891	1,511,202	49,126	8,747	10,740	38,221	2,237	50,858	3,920	38,882	1,931	254,438	19,043	26,739	99,328	92,676	320,154	25,230	1,585	105,834	1,149,689
Daily Average	7,290	4,140	134	24	29	105	6	140	10	107	5	697	53	73	272	254	877	69	5	290	3,150

TABLE 30.—Crude runs to stills and refinery receipts of crude oil by origin of the crude and method of transportation by States and districts, 1962

(Thousands of barrels)

State and district	Crude runs to stills	Refinery fuel use and losses	Refinery receipts of domestic crude—								Refinery receipts of foreign crude	
			By State of origin of domestic crude	Change in refinery stocks	By receiving State and method of transportation							
					Intrastate			Interstate			Pipelines	Tankers and barges
					Pipe-lines	Tank cars and trucks	Tankers and barges	Pipe-lines	Tank cars and trucks	Tankers and barges		
Delaware, Massachusetts, Rhode Island	51,423	150	-----	−410	-----	-----	-----	-----	-----	14,650	-----	36,513
Florida, Georgia, South Carolina, Virginia	15,897	2	430	−119	-----	-----	-----	-----	552	3,275	-----	11,953
Maryland	6,365	−12	-----	−172	-----	-----	-----	-----	-----	847	-----	5,334
New Jersey	143,512	94	-----	−530	-----	-----	-----	-----	-----	51,845	-----	91,231
New York: East	6,454	-----	-----	−138	-----	-----	-----	-----	-----	-----	-----	6,316
West	18,769	-----	1,807	+29	-----	-----	-----	14,268	-----	-----	-----	4,530
Pennsylvania: East	182,572	171	-----	−604	-----	-----	-----	-----	-----	94,023	-----	88,116
West	15,603	−2	6,004	+25	5,936	68	-----	8,391	188	1,043	-----	-----
West Virginia	2,351	-----	3,131	−3	1,480	66	-----	410	392	-----	-----	-----
Total District 1	[1] 442,946	403	11,372	−1,922	7,416	134	-----	23,069	1,132	165,683	-----	243,993
Illinois	205,712	20	82,163	+266	31,208	97	-----	172,765	-----	1,928	-----	-----
Indiana	150,581	−2	4,363	−224	440	936	-----	148,379	600	-----	-----	-----
Kansas	113,618	7	127,309	+468	86,290	2,137	-----	25,411	255	-----	-----	-----
Kentucky, Tennessee	43,057	−5	21,381	−50	5,269	349	15,763	4,214	-----	17,407	-----	-----
Michigan	49,152	3	18,253	−56	16,741	579	-----	24,342	-----	-----	7,437	-----
Minnesota, Wisconsin	30,534	−15	-----	−71	-----	-----	-----	6,761	2,031	1,361	20,295	-----
Missouri	22,731	-----	-----	−123	-----	-----	-----	22,608	-----	-----	-----	-----
Nebraska	947	−1	19,438	−10	-----	-----	-----	936	-----	-----	-----	-----
North & South Dakota	16,102	15	23,363	−55	15,352	710	-----	-----	-----	-----	-----	-----
Ohio: East	35,047	-----	-----	−21	2,502	514	-----	32,010	-----	-----	-----	-----
West	98,147	−27	4,973	+269	-----	26	-----	90,853	-----	-----	6,386	[2] 1,124
Oklahoma	133,387	−16	194,748	−40	100,509	1,563	-----	31,259	-----	-----	-----	-----
Total District 2	899,015	−21	495,991	+353	258,311	6,911	15,763	559,538	2,886	20,696	34,118	1,124

Alabama, Mississippi	13,151	−20	59,089	−5	6,637	1,985	1,341	----------	183	2,006	----------	974
Arkansas	27,255	−2	35,297	−65	25,291	1,259	----------	589	49	----------	----------	----------
Louisiana	272,217	120	454,966	−219	149,874	2,955	47,699	69,980	33	1,371	----------	206
New Mexico	9,433	11	108,847	+75	9,039	480	----------	----------	----------	----------	----------	----------
Texas	837,820	118	946,948	+440	579,866	9,447	37,481	134,841	13	76,609	----------	[3] 121
Total District 3	1,159,876	227	1,605,147	+226	770,707	16,126	86,521	205,410	278	79,986	----------	1,301
Colorado	13,389	6	39,287	+19	388	678	----------	12,141	154	----------	53	----------
Montana	28,088	5	28,396	−9	8,908	445	----------	18,422	----------	----------	[4] 309	----------
Utah	30,655	−6	31,290	+126	5,954	106	----------	24,477	238	----------	----------	----------
Wyoming	38,848	−1	143,378	+268	36,579	965	----------	----------	1,547	----------	24	----------
Total District 4	110,980	4	242,351	+404	51,829	2,194	----------	55,040	1,939	----------	386	----------
California	393,946	593	[5] 306,030	+1,428	245,145	11,506	38,639	22,761	----------	6,313	----------	71,603
Washington, Oregon, Hawaii	62,868	−229	----------	−297	----------	----------	----------	----------	----------	4,958	45,260	12,124
Total District 5	456,814	364	306,030	+1,131	245,145	11,506	38,639	22,761	----------	11,271	45,260	83,727
United States, total	3,069,631	977	2,660,891	+192	1,333,408	36,871	140,923	865,818	6,235	277,636	[6] 79,764	330,145
Daily Average	8,410	3	7,290	+1	3,652	101	387	2,372	17	761	218	905

---

[1] Includes 279,223 in Delaware River Valley.

[2] Transhipped from PAD District III.

[3] Includes tank cars and trucks 57.

[4] Includes tank cars and trucks 64.

[5] Includes 8,670 from Alaska and 10 from Nevada.

[6] Excludes crude oil imported for direct fuel use by pipelines.

TABLE 31.—Daily average total demand for crude petroleum in the United States 1961–62, by State of origin and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Alabama	26.7	13.8	19.7	23.0	15.4	6.6	21.4	17.8	15.5	15.6	28.9	17.5	18.5
Alaska	8.5	5.8	9.2	12.1	19.3	13.1	13.6	21.7	15.3	19.7	30.3	26.4	16.3
Arkansas	78.3	88.9	79.9	71.9	76.6	86.9	78.5	81.9	83.0	77.5	76.8	83.0	80.2
California	809.5	852.4	807.6	819.4	839.2	863.1	822.3	833.7	785.1	841.0	848.6	828.5	829.0
Colorado	123.4	141.9	143.9	115.4	130.3	118.3	141.6	126.3	129.3	115.5	139.0	128.1	129.3
Florida	.6	.5	3.7	.5	.6	1.6	3.6	.1	.5	.7	.9	.7	1.2
Illinois	196.9	196.8	223.8	181.6	172.5	207.6	210.3	232.1	248.6	218.2	216.8	212.4	209.9
Indiana	31.2	32.5	31.4	27.5	28.5	23.5	46.4	33.7	28.5	29.0	31.0	33.0	31.4
Kansas	325.2	301.2	294.5	299.9	300.0	303.9	328.2	342.7	319.1	264.5	316.7	325.9	310.2
Kentucky	44.0	58.4	49.6	46.6	41.8	48.1	53.4	54.3	49.2	54.9	45.6	49.9	49.6
Louisiana	1,198.4	1,172.8	1,121.3	1,071.7	1,181.1	1,189.8	1,149.1	1,190.2	1,071.0	1,196.4	1,219.5	1,201.3	1,163.7
Michigan	53.4	53.4	52.5	48.0	51.2	56.0	60.6	54.2	51.4	51.0	46.5	49.2	52.3
Mississippi	139.2	151.6	145.4	155.7	156.1	138.3	160.5	143.7	153.9	158.5	142.0	145.8	149.2
Montana	71.4	86.9	77.7	75.2	73.6	78.0	80.5	82.6	83.9	82.4	88.2	118.9	82.4
Nebraska	75.3	62.3	48.7	76.6	63.5	38.8	62.3	83.3	76.8	73.5	53.3	72.3	65.7
New Mexico	294.5	293.0	303.9	310.5	330.5	267.5	322.7	321.5	270.2	299.2	303.8	303.7	302.0
New York	4.1	4.3	4.6	5.4	4.6	3.9	3.6	4.0	4.3	4.5	5.1	5.4	4.5
North Dakota	68.0	60.9	74.9	55.0	37.6	71.3	64.9	69.3	64.9	69.9	72.3	67.5	64.7
Ohio	14.1	14.7	13.4	13.9	15.5	13.2	15.0	15.2	17.6	16.6	15.9	16.5	15.2
Oklahoma	553.2	540.3	544.2	515.1	520.2	524.1	501.6	565.6	535.0	508.2	495.8	518.7	526.8
Pennsylvania	19.2	11.4	16.7	15.0	10.9	11.4	11.0	8.3	13.2	18.2	12.7	19.6	14.0
Texas	2,694.6	2,722.3	2,596.8	2,539.2	2,469.0	2,444.2	2,531.1	2,579.7	2,389.0	2,575.7	2,518.2	2,625.4	2,556.6
Utah	109.3	101.9	82.6	90.7	93.8	89.4	86.4	88.9	89.1	77.1	106.6	84.5	91.6
West Virginia	6.5	7.5	6.7	5.8	6.0	8.1	5.3	8.6	5.7	6.7	9.8	9.4	7.2
Wyoming	403.8	432.6	377.5	325.1	422.8	400.8	409.2	407.5	382.7	384.3	355.5	392.2	391.2
Other States	1.1	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.4	[1] 1.5
Total domestic crude	7,350.4	7,409.8	7,131.9	6,902.4	7,052.2	7,009.0	7,184.6	7,368.4	6,884.3	7,160.3	7,181.3	7,337.2	7,164.2
Foreign crude	1,043.7	1,081.2	997.5	950.6	1,006.6	1,012.8	1,130.9	1,118.5	1,118.6	1,046.8	1,056.8	1,045.8	1,050.7
Grand total 1961	8,394.1	8,491.0	8,129.4	7,853.0	8,058.8	8,021.8	8,315.5	8,486.9	8,002.9	8,207.1	8,238.1	8,383.0	8,214.9
Pennsylvania Grade (included above)	33.4	28.6	32.3	30.1	26.8	27.9	34.6	27.0	18.2	34.6	33.9	50.7	31.6

1962:[2]													
Alabama	17.8	24.3	20.2	21.4	17.1	12.4	11.3	21.9	30.5	26.8	25.6	25.6	21.2
Alaska	26.3	23.5	30.6	25.0	38.8	17.0	29.8	31.4	22.6	30.3	22.9	40.0	28.3
Arkansas	72.0	79.1	80.7	78.3	76.7	75.2	74.7	90.6	70.0	76.7	75.7	75.0	77.1
California	781.6	818.0	772.1	802.3	772.6	844.7	828.7	822.3	825.4	810.4	805.5	792.8	806.1
Colorado	114.9	121.4	101.9	119.2	119.4	120.3	121.5	108.0	111.7	118.5	105.0	108.6	114.2
Florida	.5	.6	3.1	1.0	--------	--------	3.4	--------	--------	.1	.4	3.0	1.0
Illinois	204.2	233.3	209.4	196.1	189.5	216.9	214.5	220.1	212.9	205.6	188.1	238.1	210.6
Indiana	31.3	29.5	33.8	29.3	35.2	32.7	31.0	33.5	36.2	29.9	33.3	28.5	32.0
Kansas	307.4	306.0	317.1	273.5	322.8	314.3	330.9	325.1	307.1	295.6	292.6	297.7	307.6
Kentucky	49.2	46.8	44.4	42.3	53.7	51.0	52.0	48.1	50.9	48.8	52.9	49.3	49.1
Louisiana	1,265.7	1,302.8	1,280.7	1,261.5	1,302.3	1,280.9	1,278.1	1,293.2	1,322.9	1,389.3	1,410.2	1,400.0	1,315.7
Michigan	50.3	44.3	52.0	45.2	41.9	53.3	42.7	48.4	45.9	43.9	50.0	47.9	47.2
Mississippi	135.5	144.7	152.1	146.4	157.3	146.3	158.2	159.9	132.6	158.9	151.2	148.1	149.3
Montana	60.7	107.6	79.8	86.8	68.4	90.7	78.1	92.5	92.1	80.2	90.5	92.4	84.7
Nebraska	79.8	65.6	67.1	64.1	69.6	71.0	62.3	73.5	63.4	72.4	61.0	72.5	68.6
New Mexico	288.5	332.9	295.3	303.4	325.4	316.8	295.7	263.3	335.5	252.2	294.7	293.4	299.3
New York	5.3	4.6	4.9	5.0	4.9	5.2	5.4	4.3	4.9	4.8	5.1	4.8	4.9
North Dakota	78.7	72.3	71.9	69.5	67.2	69.7	67.3	65.5	51.7	76.8	71.8	54.0	68.0
Ohio	15.0	13.8	14.1	13.7	13.4	14.3	14.1	12.5	17.6	11.2	13.4	15.0	14.0
Oklahoma	600.9	541.4	560.2	561.8	518.6	562.5	556.9	489.4	554.5	506.6	494.8	540.3	540.6
Pennsylvania	12.3	13.0	17.4	15.8	11.9	15.0	13.2	9.7	17.3	15.3	12.4	15.3	14.0
Texas	2,746.8	2,731.5	2,455.5	2,573.2	2,536.1	2,619.7	2,597.6	2,559.8	2,457.2	2,424.4	2,529.1	2,558.3	2,564.6
Utah	91.8	87.7	83.0	82.5	75.3	72.8	84.5	81.5	80.5	89.2	93.6	97.8	85.0
West Virginia	8.2	9.8	7.8	8.7	8.0	8.8	9.8	9.9	8.0	9.6	9.5	8.4	8.9
Wyoming	455.9	418.1	388.5	353.8	396.4	459.3	411.6	392.4	408.3	373.9	348.0	393.4	399.9
Other States	1.3	1.3	1.3	1.0	1.1	1.0	1.1	1.1	1.2	1.2	1.2	1.1	[3] 1.2
Total domestic crude	7,501.9	7,573.9	7,144.9	7,180.8	7,223.6	7,471.8	7,374.4	7,257.9	7,260.9	7,152.6	7,238.5	7,401.3	7,313.1
Foreign crude	1,089.2	1,102.8	1,079.7	944.4	1,077.4	1,177.0	1,182.9	1,237.6	1,184.5	1,128.5	1,158.8	1,129.2	1,124.6
Grand total 1962	8,591.1	8,676.7	8,224.6	8,125.2	8,301.0	8,648.8	8,557.3	8,495.5	8,445.4	8,281.1	8,397.3	8,530.5	8,437.7
Pennsylvania Grade (included above)	21.1	33.6	46.4	24.1	31.5	35.7	44.3	17.9	36.3	35.3	33.9	34.5	32.9

---

[1] Arizona, 0.2; Missouri, 0.2; Nevada, 0.4; South Dakota, 0.6; Tennessee, 0.1; and Virginia less than 0.05.

[2] Preliminary figures.

[3] Arizona, 0.1; Missouri, 0.1; Nevada, 0.4; South Dakota, 0.5; Tennessee, 0.1; and Virginia less than 0.05.

TABLE 32.—Total demand for crude petroleum in the United States, 1961–62, by States of origin and months

(Thousand barrels)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Alabama	828	387	612	691	476	199	663	552	465	484	867	542	6, 766
Alaska	265	162	284	364	598	393	422	673	458	612	910	818	5, 959
Arkansas	2, 426	2, 490	2, 476	2, 157	2, 376	2, 607	2, 433	2, 539	2, 491	2, 401	2, 304	2, 574	29, 274
California	25, 096	23. 868	25, 038	24, 582	26, 015	25, 894	25, 491	25, 845	23, 554	26, 071	25, 459	25, 685	302, 598
Colorado	3, 825	3, 972	4, 463	3, 462	4, 038	3, 549	4, 389	3, 916	3, 879	3, 580	4, 169	3, 971	47, 213
Florida	19	15	115	14	20	49	113	4	15	23	26	22	435
Illinois	6, 105	5, 511	6, 939	5, 449	5, 346	6, 229	6, 518	7, 194	7, 459	6, 763	6, 503	6, 584	76, 600
Indiana	966	911	973	824	885	704	1, 439	1, 046	856	898	931	1, 024	11, 457
Kansas	10, 078	8, 433	9, 128	8, 997	9, 301	9, 116	10, 175	10. 623	9, 573	8, 198	9, 501	10, 104	113, 227
Kentucky	1, 364	1, 634	1, 539	1, 397	1, 295	1, 442	1, 657	1, 682	1, 477	1, 702	1, 368	1, 546	18, 103
Louisiana	37, 151	32, 837	34, 759	32, 150	36, 613	35, 694	35, 623	36, 896	32, 130	37, 087	36, 586	37, 240	424, 766
Michigan	1, 654	1, 495	1, 628	1, 440	1, 588	1, 679	1, 879	1, 679	1, 541	1, 582	1, 395	1, 525	19, 085
Mississippi	4, 315	4, 245	4, 506	4, 670	4. 840	4, 151	4, 974	4, 454	4, 616	4, 912	4, 259	4, 519	54, 461
Montana	2, 213	2, 435	2, 408	2, 256	1, 973	2, 339	2, 497	2, 562	2, 516	2. 553	2, 647	3, 685	30, 084
Nebraska	2, 335	1, 745	1, 511	2, 298	1, 967	1, 163	1, 932	2, 583	2, 305	2, 280	1, 600	2, 242	23, 961
New Mexico	9, 128	8, 202	9, 420	9, 316	10, 247	8, 027	10, 003	9, 966	8, 105	9, 276	9, 113	9, 414	110, 217
New York	128	119	144	161	142	117	112	123	130	140	152	167	1, 635
North Dakota	2, 109	1, 707	2, 323	1, 651	1, 167	2, 138	2, 012	2, 149	1, 946	2, 165	2, 170	2, 092	23, 629
Ohio	436	412	414	416	479	396	464	472	528	516	477	513	5, 523
Oklahoma	17, 150	15, 128	16, 869	15, 452	16, 125	15, 722	15, 549	17. 534	16, 049	15, 755	14, 875	16, 079	192, 287
Pennsylvania	596	318	517	450	338	341	340	256	396	564	380	607	5, 103
Texas	83, 532	76, 224	80, 500	76, 176	76, 538	73, 326	78, 463	79, 969	71, 671	79, 847	75, 547	81, 388	933, 181
Utah	3, 388	2, 854	2, 560	2, 722	2, 908	2, 683	2, 678	2, 757	2, 674	2, 390	3, 197	2, 619	33, 430
West Virginia	203	211	208	175	187	242	166	266	170	208	295	291	2, 622
Wyoming	12, 517	12, 113	11, 702	9, 753	13, 107	12, 025	12, 684	12, 632	11, 481	11, 913	10, 665	12, 160	142, 752
Other States	35	47	53	48	50	46	46	47	44	48	44	43	[1] 551
Total domestic crude	227, 862	207, 475	221. 089	207, 071	218, 619	210, 271	222, 722	228, 419	206, 529	221, 968	215. 440	227, 454	2, 614, 919
Foreign crude	32, 354	30, 273	30, 925	28, 520	31, 205	30. 383	35, 055	34, 675	33, 559	32, 452	31, 703	32, 419	383, 523
Grand total 1961	260, 216	237, 748	252, 014	235, 591	249, 824	240, 654	257, 777	263, 094	240, 088	254, 420	247, 143	259, 873	2, 998, 442
Daily average:													
Domestic crude	7, 350	7, 410	7, 132	6, 902	7, 052	7, 009	7, 185	7, 368	6, 884	7, 160	7, 181	7, 337	7, 164
Domestic and foreign crude	8, 394	8, 491	8, 129	7, 853	8, 059	8, 022	8, 315	8, 487	8, 003	8, 207	8, 238	8, 383	8, 215
Pennsylvania Grade (included above)	1, 036	802	1, 000	904	831	839	1, 074	838	546	1, 074	1, 016	1, 572	11, 532

1962: [2]													
Alabama	553	681	626	641	531	372	351	682	916	830	769	793	7, 745
Alaska	816	658	947	752	1, 202	510	923	971	680	941	686	1, 240	10, 326
Arkansas	2, 233	2, 214	2, 502	2, 350	2, 379	2, 255	2, 315	2, 809	2, 096	2, 378	2, 271	2, 325	28, 127
California	24, 228	22, 906	23, 935	24, 068	23, 952	25, 342	25, 689	25, 492	24, 763	25, 122	24, 165	24, 577	294, 239
Colorado	3, 563	3, 400	3, 160	3, 577	3, 700	3, 609	3, 765	3, 349	3, 353	3, 674	3, 151	3, 366	41, 667
Florida	17	16	97	31	1	----------	104	----------	----------	3	13	92	374
Illinois	6, 329	6, 532	6, 491	5, 882	5, 875	6, 506	6, 649	6, 823	6, 388	6, 372	5, 642	7, 380	76, 869
Indiana	971	825	1, 048	879	1, 092	980	962	1, 040	1, 086	927	998	882	11, 690
Kansas	9, 529	8, 568	9, 831	8, 206	10, 005	9, 428	10, 259	10, 079	9, 212	9, 159	8, 777	9, 228	112, 281
Kentucky	1, 524	1, 309	1, 376	1, 269	1, 665	1, 531	1, 612	1, 490	1, 526	1, 514	1, 589	1, 528	17, 933
Louisiana	39, 237	36, 480	39, 702	37, 846	40, 372	38, 428	39, 621	40, 089	39, 688	43, 069	42, 305	43, 401	480, 238
Michigan	1, 560	1, 241	1, 612	1, 357	1, 299	1, 599	1, 324	1, 499	1, 377	1, 361	1, 501	1, 486	17, 216
Mississippi	4, 199	4, 051	4, 716	4, 388	4, 877	4, 390	4, 903	4, 957	3, 979	4, 925	4, 535	4, 591	54, 511
Montana	1, 882	3, 012	2, 473	2, 603	2, 120	2, 722	2, 421	2, 869	2, 762	2, 486	2, 714	2, 865	30, 929
Nebraska	2, 474	1, 836	2, 081	1, 920	2, 158	2, 132	1, 930	2, 279	1, 901	2, 245	1, 831	2, 247	25, 034
New Mexico	8, 943	9, 322	9, 154	9, 102	10, 086	9, 505	9, 168	8, 161	10, 064	7, 819	8, 841	9, 095	109, 260
New York	165	130	151	149	152	155	170	135	147	149	154	150	1, 807
North Dakota	2, 440	2, 023	2, 230	2, 086	2, 084	2, 090	2, 087	2, 032	1, 552	2, 382	2, 153	1, 676	24, 835
Ohio	465	388	436	411	414	430	436	388	528	347	402	464	5, 109
Oklahoma	18, 629	15, 159	17, 367	16, 853	16, 078	16, 876	17, 263	15, 170	16, 634	15, 707	14, 843	16, 750	197, 329
Pennsylvania	380	365	540	476	369	449	408	300	519	475	373	473	5, 127
Texas	85, 149	76, 481	76, 118	77, 197	78, 619	78, 589	80, 525	79, 354	73, 717	75, 155	75, 875	79, 308	936, 087
Utah	2, 847	2, 455	2, 572	2, 476	2, 333	2, 182	2, 618	2, 525	2, 414	2, 765	2, 809	3, 032	31, 028
West Virginia	255	273	243	260	246	265	305	307	241	298	283	260	3, 236
Wyoming	14, 131	11, 708	12, 044	10, 615	12, 290	13, 779	12, 762	12, 164	12, 250	11, 592	10, 440	12, 196	145, 971
Other States	42	38	41	30	34	30	36	33	35	36	36	35	[3] 426
Total domestic crude	232, 561	212, 071	221, 493	215, 424	223, 933	224, 154	228, 606	224, 997	217, 828	221, 731	217, 156	229, 440	2, 669, 394
Foreign crude	33, 764	30, 878	33, 470	28, 335	33, 400	35, 311	36, 670	38, 366	35, 534	34, 984	34, 765	35, 006	410, 483
Grand total 1962	266, 325	242, 949	254, 963	243, 759	257, 333	259, 465	265, 276	263, 363	253, 362	256, 715	251, 921	264, 446	3, 079, 877
Daily average:													
Domestic crude	7, 502	7, 574	7, 145	7, 181	7, 224	7, 472	7, 374	7, 258	7, 261	7, 153	7, 239	7, 401	7, 313
Domestic and foreign crude	8, 591	8, 677	8, 225	8, 125	8, 301	8, 649	8, 557	8, 496	8, 445	8, 281	8, 397	8, 531	8, 438
Pennsylvania Grade (included above)	654	942	1, 437	723	975	1, 071	1, 373	558	1, 089	1, 095	1, 017	1, 069	12, 003

[1] Arizona, 73; Missouri, 72; Nevada, 154; South Dakota, 233; Tennessee, 17; and Virginia, 2.

[2] Preliminary figures.

[3] Arizona, 43; Missouri, 55; Nevada, 137; South Dakota, 170; Tennessee, 18; and Virginia, 3.

STOCKS

Stocks of all oils at the end of 1962 totaled 836.9 million barrels, 11.8 million barrels higher than a year ago. Stocks of refined products increased 10.2 million barrels, crude-oil stocks increased 7.3 million barrels, while stocks of natural-gas liquids declined 5.7 million barrels during the year.

The buildup of stocks of refined products occurred in PAD district V where total stocks of residual fuel oil increased 8.3 million barrels, and other refined products increased 5.4 million. Early in the year there was concern over the low level of stocks in that area. In May the Oil Import Administration increased the crude and unfinished oils import quota for the first half of 1962 by 11,000 barrels daily to allow for a stock build-up. Demand in the last half of the year was much lower than anticipated and resulted in the large stock increase.

The changes in stocks of crude oil and natural-gas liquids for the year can be considered adjustments to get the stocks at better working levels.

TABLE 33.—Stocks of crude petroleum, natural-gas liquids, and refined products in the United States at end of year

(Thousand barrels)

	1958 [1]	1959 [2]	1960 [2]	1961 [2]	1962 [2]
Crude petroleum:					
At refineries	69, 568	69, 305	66, 450	64, 644	64, 836
Pipeline and tank farm	172, 458	167, 147	152, 848	159, 105	167, 390
Producers	20, 716	20, 677	20, 502	20, 915	19, 785
Total crude petroleum	262, 742	257, 129	239, 800	244, 664	252, 011
Natural-gas liquids	22, 752	24, 887	28, 931	37, 067	31, 385
Refined products	504, 044	526, 954	515, 827	543, 343	553, 473
Grand total	789, 538	808, 970	784, 558	825, 074	836, 869

[1] Includes Alaska.

[2] Includes Alaska and Hawaii.

TABLE 34.—Stocks of crude petroleum in the United States by State of origin, by month: 1962

(Thousand barrels)

State of origin	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	558	696	703	778	747	341	301	359	460	300	278	287	306
Alaska	578	571	681	559	655	331	681	641	554	704	654	846	512
Arizona	----------	----------	----------	----------	----------	----------	1	1	1	1	----------	----------	----------
Arkansas	1, 758	1, 867	1, 846	1, 702	1, 650	1, 651	1, 681	1, 695	1, 195	1, 289	1, 246	1, 234	1, 216
California	21, 726	22, 399	21, 817	22, 664	22, 853	24, 056	23, 223	22, 884	22, 780	22, 535	22, 822	23. 277	24, 059
Colorado	2, 655	2, 770	2, 714	3, 247	3, 232	3, 204	3, 077	2, 865	3, 292	3, 167	2, 989	3, 249	3, 448
Florida	84	106	127	64	69	102	133	66	98	133	169	184	128
Illinois	6, 606	6, 797	6, 429	6, 558	7, 018	7, 619	7, 423	7, 311	6, 933	6, 990	7, 141	8, 112	7, 062
Indiana	360	294	336	317	424	304	396	429	314	351	354	339	379
Kansas	8, 412	7, 918	8, 009	7, 866	8, 980	8, 604	8, 442	7, 641	7. 058	6, 922	7, 537	8, 028	8. 207
Kentucky	1, 267	1, 194	1, 231	1, 321	1, 501	1, 379	1, 331	1, 287	1, 345	1, 332	1, 421	1, 389	1, 456
Louisiana	19, 760	20, 382	20, 702	21, 931	23, 803	22, 630	22, 099	21, 732	21, 787	22, 827	22. 759	22. 316	22, 623
Michigan	1, 075	1, 012	994	1, 011	1, 094	1, 230	1, 077	1, 203	1, 146	1, 140	1, 219	1, 096	976
Mississippi	2, 573	2, 694	2, 600	2, 546	2, 520	2, 267	2, 363	2, 215	2, 124	2, 159	2, 101	2, 274	2, 533
Montana	4, 016	4, 770	4, 181	4, 407	4, 371	4, 923	4, 777	5, 091	4, 935	4, 800	5, 039	4, 934	4, 735
Nebraska	2, 234	1, 862	1, 903	1, 970	2, 146	2, 157	2, 102	2, 313	2, 154	2, 311	2, 134	2, 286	2. 050
New Mexico	10, 427	10, 643	9, 846	10, 274	10, 259	9, 373	8, 558	8, 383	9, 153	7, 827	9, 177	9, 500	9, 875
New York	62	44	48	46	44	50	46	52	77	62	68	60	44
North Dakota	1, 308	1, 098	1, 032	1, 005	984	1, 014	970	1. 054	1, 042	1, 213	979	915	1, 637
Ohio	694	661	655	659	673	715	710	710	768	644	727	748	651
Oklahoma	17, 800	16, 168	16, 721	16, 851	16, 997	17, 156	16, 306	15, 522	16, 843	16, 565	17, 587	19, 192	19, 087
Pennsylvania	1, 452	1, 519	1, 554	1, 457	1, 452	1, 552	1, 535	1, 565	1, 717	1, 610	1, 593	1, 645	1, 550
South Dakota	3	3	3	3	3	3	3	3	3	3	3	3	3
Texas	106, 623	103, 646	102, 231	105, 898	106, 574	106, 585	104, 857	102, 966	101, 668	104, 556	107, 398	108, 329	107, 044
Utah	3, 120	3, 082	2, 872	2, 862	2, 725	2, 840	3, 062	2, 951	3, 013	3, 230	3, 269	3, 165	3, 056
West Virginia	781	793	759	816	840	905	939	948	951	969	971	960	890
Wyoming	16, 699	14, 837	14, 829	15, 186	16, 697	16, 356	14, 812	14, 430	14, 149	13, 685	14, 339	15, 670	15, 895
Total domestic crude	232, 631	227, 826	224, 823	231, 998	238, 311	237, 347	230, 905	226, 317	225, 560	227, 325	233. 974	240, 038	239, 422
Foreign crude located in:													
Districts I–IV	8, 393	10, 095	10, 214	10, 567	12, 925	13, 524	12, 629	10, 302	11, 782	10, 525	11, 782	10, 138	8, 997
District V	3, 640	4, 523	5, 129	3, 067	4, 623	4, 805	4, 206	5, 799	6, 246	6, 376	5, 963	6, 108	3, 592
Total foreign crude	12, 033	14, 618	15, 343	13, 634	17, 548	18, 329	16, 835	16. 101	18, 028	16, 901	17, 745	16, 246	12. 589
Total crude stocks	244, 664	242, 444	240, 166	245, 632	255, 859	255, 676	247, 740	242, 418	243, 588	244, 226	251, 719	256, 284	252, 011
Pennsylvania grade (included above)	2, 295	2, 685	2, 678	2, 319	2, 671	2, 829	2, 826	2, 565	3, 123	3, 010	3, 002	2, 997	2, 783

TABLE 35.—Stocks of crude petroleum in the United States by location, by month: 1962

(Thousand barrels)

State	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Alabama	189	230	194	234	274	207	251	264	227	218	228	317	236
Alaska	396	277	458	125	124	212	178	398	247	255	356	297	290
Arizona	447	448	447	446	447	447	448	448	448	448	447	447	448
Arkansas	1, 635	1, 709	1, 766	1, 702	1, 644	1, 650	1, 597	1, 597	1, 568	1, 653	1, 617	1, 663	1, 656
California, Oregon, Washington	25, 559	27, 300	27, 382	26, 500	28, 496	28, 958	27, 841	28, 841	29, 542	29, 283	29, 402	29, 804	28, 346
Colorado	1, 401	1, 343	1, 296	1, 352	1, 656	1, 552	1, 645	1, 479	1, 496	1, 433	1, 452	1, 542	1, 462
Florida, Georgia, South Carolina, Virginia	696	1, 087	914	659	885	915	761	803	913	837	655	851	512
Hawaii	710	708	507	427	410	757	814	808	598	715	522	894	235
Illinois	13, 810	13, 601	14, 821	15, 314	15, 081	16, 144	15, 162	14, 916	15, 840	14, 099	14, 934	15, 513	15, 617
Indiana	4, 038	3, 980	3, 492	3, 754	3, 831	3, 923	3, 686	4, 032	4, 115	4, 263	3, 970	4, 316	4, 340
Iowa, Missouri	6, 100	5, 828	5, 877	6, 103	6, 654	6, 976	6, 755	6, 738	6, 223	6, 127	6, 275	6, 261	6, 480
Kansas	10, 186	8, 718	8, 800	9, 702	10, 885	10, 229	10, 157	9, 230	9, 035	9, 011	9, 744	10, 141	10, 361
Kentucky, Tennessee	3, 404	3, 308	3, 483	3, 698	3, 641	3, 558	3, 568	3, 529	3, 598	3, 681	3, 654	3, 640	3, 376
Louisiana	14, 650	15, 158	16, 270	16, 479	15, 289	15, 153	15, 196	14, 879	15, 292	14, 865	14, 932	14, 640	15, 689
Maryland	498	491	584	618	564	393	306	408	573	407	540	401	326
Massachusetts, Delaware, Rhode Island	1, 491	2, 042	1, 532	1, 566	2, 707	1, 921	2, 336	14, 640	1, 128	1, 237	1, 656	1, 587	1, 081
Michigan	1, 988	1, 899	1, 861	1, 937	2, 110	2, 274	2, 156	2, 095	2, 187	2, 119	2, 228	2, 076	1, 936
Minnesota, Wisconsin	1, 744	1, 743	1, 676	1, 500	1, 611	2, 050	1, 842	1, 733	1, 641	1, 532	1, 365	1, 478	1, 618
Mississippi	1, 841	1, 913	1, 766	1, 733	1, 549	1, 515	1, 599	1, 479	1, 453	1, 623	1, 466	1, 520	1, 446
Montana	2, 622	2, 543	2, 410	2, 534	2, 758	2, 866	2, 442	2, 495	2, 424	2, 376	2, 297	2, 624	2, 259
Nebraska	1, 860	1, 914	1, 820	1, 952	1, 799	1, 809	1, 769	1, 652	1, 644	1, 612	1, 671	1, 613	1, 846
New Jersey	5, 692	6, 294	5, 585	5, 336	7, 244	6, 380	6, 156	4, 728	4, 773	4, 695	5, 678	4, 109	5, 131
New Mexico	3, 608	3, 422	3, 319	3, 547	3, 353	3, 307	3, 278	3, 255	3, 195	3, 409	3, 776	4, 302	4, 285
New York	906	742	870	1, 045	1, 018	1, 007	1, 020	755	847	881	754	978	975
North Dakota	829	885	799	809	708	687	673	788	721	863	747	650	1, 205
Ohio	6, 088	6, 138	6, 155	6, 337	6, 745	7, 197	6, 731	7, 210	6, 314	6, 430	6, 992	6, 947	6, 194
Oklahoma	20, 398	18, 230	15, 677	15, 703	17, 148	16, 794	17, 097	16, 992	18, 074	18, 102	18, 887	19, 761	21, 087
Pennsylvania	8, 904	9, 330	9, 062	9, 955	9, 228	10, 593	9, 256	9, 614	10, 552	9, 963	10, 956	10, 465	8, 448
South Dakota	3	3	3	3	3	3	3	3	3	3	3	3	3
Texas	92, 469	91, 413	92, 013	95, 121	98, 114	96, 460	93, 980	91, 480	90, 060	93, 097	94, 872	97, 149	94, 297
Utah	920	1, 015	964	787	845	981	1, 004	906	943	1, 135	1, 059	1, 062	1, 170
West Virginia	704	725	712	749	739	779	768	786	829	792	773	769	692
Wyoming	8, 878	8, 007	7, 651	7, 905	8, 299	7, 979	7, 265	6, 671	7, 085	7, 062	7, 811	8, 464	8, 964
Total	244, 664	242, 444	240, 166	245, 632	255, 859	255, 676	247, 740	242, 418	243, 588	244, 226	251, 719	256, 284	252, 011

TABLE 36.—Stocks of crude petroleum in the United States by classification and location, by month: 1962

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
At refineries:													
Alabama	111	186	158	174	207	153	199	204	185	189	195	281	182
Arkansas	447	481	531	496	437	457	422	393	367	412	366	396	382
California, Oregon, Washington	11,586	12,688	13,092	12,067	14,155	14,080	12,672	13,761	15,328	15,061	14,624	15,624	13,192
Colorado	230	214	253	162	382	283	320	274	206	246	290	304	249
Florida, Georgia, South Carolina, Virginia	612	981	787	634	816	813	732	737	815	810	592	761	493
Hawaii	710	708	507	427	410	757	814	808	598	715	522	894	235
Illinois	3,120	2,982	3,189	3,650	3,039	3,382	3,289	3,576	4,340	3,787	3,928	3,487	3,386
Indiana	1,624	1,526	1,183	1,537	1,480	1,370	1,256	1,518	1,264	1,225	1,284	1,497	1,400
Kansas	1,462	1,418	1,428	1,455	1,856	1,706	1,777	1,698	1,521	1,576	1,734	1,797	1,930
Kentucky, Tennessee	1,716	1,670	1,807	2,017	1,868	1,848	1,841	1,692	1,691	1,833	1,714	1,858	1,666
Louisiana	4,939	4,744	5,332	5,298	5,099	5,564	5,029	4,956	5,267	4,586	4,715	4,488	4,720
Maryland	498	491	584	618	564	393	306	408	573	407	540	401	326
Massachusetts, Delaware, Rhode Island	1,491	2,042	1,532	1,566	2,707	1,921	2,336	1,406	1,128	1,237	1,656	1,587	1,081
Michigan	880	847	827	875	989	1,019	971	946	981	918	839	832	824
Minnesota, Wisconsin	1,147	1,193	1,143	980	1,062	1,417	1,305	1,202	1,047	885	886	1,023	1,076
Mississippi	226	240	234	177	144	116	110	115	112	243	204	185	150
Missouri	219	179	161	183	145	173	165	99	130	103	138	128	96
Montana	585	532	410	494	605	596	572	496	523	438	476	570	576
Nebraska	49	47	45	45	46	34	34	38	36	33	32	33	39
New Jersey	5,328	5,696	5,242	5,336	6,759	6,255	5,913	4,728	4,773	4,695	5,678	4,109	4,798
New Mexico	260	252	250	276	217	175	209	200	192	184	230	321	335
New York	631	516	454	603	686	527	669	390	509	569	314	564	522
North Dakota	343	325	287	310	223	180	165	238	219	279	283	181	288
Ohio	1,563	1,702	1,618	1,846	2,113	2,239	1,838	1,966	1,601	1,735	1,799	1,716	1,811
Oklahoma	2,021	2,165	1,909	1,975	1,989	1,787	1,834	1,740	1,872	1,845	1,701	2,007	1,981
Pennsylvania	6,978	7,418	7,108	8,184	7,380	8,468	7,075	7,524	8,356	7,904	8,728	8,243	6,399
Texas	15,012	15,723	16,270	17,242	16,872	16,640	16,424	16.642	15,945	16,919	16,126	16,591	15,452
Utah	348	420	416	331	339	419	482	339	414	400	394	420	474
West Virginia	40	55	55	51	49	49	46	52	59	46	54	55	37
Wyoming	468	482	528	642	629	586	535	501	587	707	706	713	736
Total at refineries	64,644	67,923	67,340	69,651	73,267	73,407	69,340	68,647	70,639	69,987	70,748	71,066	64,836

TABLE 36.—Stocks of crude petroleum in the United States by classification and location, by month: 1962—Continued

(Thousand barrels)

Classification and location	Jan. 1	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Pipeline and tank-farm stocks:													
Alabama	62	30	22	46	48	34	37	46	24	13	20	23	43
Alaska	390	275	454	121	120	208	174	395	244	253	354	294	288
Arkansas	865	910	912	883	884	875	862	886	893	918	928	949	961
California, Arizona	9,966	10,643	10,318	10,152	10,077	10,606	10,937	11,008	11,047	10,983	11,682	11,055	12,123
Colorado	1,061	999	918	1,065	1,149	1,149	1,195	1,085	1,170	1,062	1,032	1,113	1,083
Florida, New Jersey	439	694	460	25	545	218	264	57	91	20	54	83	344
Illinois	10,151	10,085	11,103	11,150	11,528	12,253	11,364	10,821	11,031	9,818	10,527	11,567	11,742
Indiana	2,354	2,394	2,249	2,157	2,301	2,503	2,400	2,484	2,821	3,008	2.656	2,789	2,910
Iowa, Missouri	5,881	5,649	5,716	5,920	6,509	6,803	6,590	6.639	6.093	6,024	6,137	6 133	6,384
Kansas	8,120	6,699	6,770	7,652	8,431	7,931	7,787	6,952	6,931	6,840	7.437	7.767	7,850
Kentucky, Tennessee	1,628	1,578	1,616	1,621	1,713	1,650	1,667	1,777	1,847	1,788	1,880	1,722	1,645
Louisiana	7,724	8,062	8,736	9,149	8,213	7,637	8,195	7,936	8,063	8,157	8,115	7,980	8,717
Michigan	938	882	864	892	951	1,085	1,015	979	1,041	1,031	1,224	1,079	942
Minnesota	597	550	533	520	549	633	537	531	594	647	479	455	542
Mississippi	1,175	1,238	1,087	1,131	975	984	1,089	954	951	950	847	930	901
Montana	1,692	1,626	1,615	1,645	1,773	1,870	1,505	1,634	1,536	1.573	1,456	1,699	1,343
Nebraska	1,686	1,742	1,645	1,782	1,628	1,660	1,615	1,494	1,493	1,464	1,524	1.465	1,682
New Mexico	2,211	1,983	1,887	2,114	1,969	2,020	1,957	1,933	1,886	2,083	2,404	2,839	2,853
New York	245	196	386	412	302	450	321	335	308	282	410	384	423
North Dakota	252	286	238	269	245	290	241	276	255	310	229	248	730
Ohio	4,445	4,356	4,457	4,411	4,552	4,878	4,813	5,164	4,633	4,615	5,113	5,151	4.303
Oklahoma	16,990	14,588	12,296	12,266	13,667	13,515	13,791	13,770	14,750	14,775	15,704	16,297	17,654
Pennsylvania	1,776	1,762	1,804	1,621	1,698	1,975	2,031	1,940	2,046	1,909	2,078	2,072	1,899
Texas	69,573	67,636	67,754	70,015	73,328	71,941	69,722	67,029	66,476	68,384	71,157	72,974	71,156
Utah	525	535	500	410	462	518	480	489	490	669	615	584	649
West Virginia	499	505	492	533	525	565	557	569	605	581	554	549	490
Wyoming	7,860	6,950	6,548	6,668	7,090	6,843	6,185	5,645	5,958	5,795	6,595	7,256	7,733
Total pipeline and tank-farm stocks	159,105	152,853	151,380	154.630	161,232	161,094	157,331	152,828	153,277	153,952	161,211	165,457	167,390
Lease stocks	20,915	21,668	21,446	21,351	21,360	21.175	21,069	20,943	19,672	20.287	19,760	19,761	19.785
Total stocks: 1962	244,664	242,444	240,166	245,632	255,859	255,676	247,740	242,418	243,588	244.226	251,719	256,284	252,011
1961	239,800	236,769	233,063	244,921	256,145	261,440	261,056	256,953	248,125	251,032	251,139	248.681	244,664

TANK STORAGE CAPACITIES

Amount of storage space assigned to the various products changes seasonally according to demand. Storage is interchangeable between "clean products" (gasoline, kerosine, distillate fuel oils, and jet fuels). Liquefied gases require special storage facilities. Tanks for storing residual fuel oil can also be used for crude oil. While above-ground storage shows little change, the use of underground caverns for storing liquefied gases has been increasing rapidly. In the two year period, from October 1960 to 1962, underground storage increased over 50 percent.

TABLE 37.—Capacity of storage tanks for finished petroleum products and capacity of underground storage facilities for liquefied gases, at refineries, gasoline plants, bulk terminals [1] and tank farms

(Thousand barrels)

Refinery district and date	Gasoline			Kerosine			Distillate fuel oil			Residual fuel oil			Military jet fuel			Liquefied petroleum gases			
																Aboveground		Underground	
	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At plants and terminals	At refineries	At plants, terminals and refineries	Total
1961:																			
East Coast:																			
April 1	26, 601	56, 316	82, 917	3, 524	18, 313	21, 837	20, 668	66, 244	86, 912	7, 460	17, 335	24, 795	883	608	1, 491	[2] 101	[2] 394	[2] 2, 019	[2] 2, 514
October 1	24, 045	57, 719	81, 764	4, 330	18, 612	22, 942	24, 087	68, 112	92, 199	7, 526	16, 751	24, 277	638	619	1, 257	[2] 101	[2] 423	[2] 2, 092	[2] 2, 616
Appalachian No. 1:																			
April 1	2, 686	6, 424	9, 110	327	915	1, 242	1, 143	4, 183	5, 326	702	428	1, 130	60	-------	60	(2)	(2)	(2)	(2)
October 1	2, 531	6, 484	9, 015	283	933	1, 216	1, 473	4, 168	5, 641	544	428	972	87	-------	87	(2)	(2)	(2)	(2)
Appalachian No. 2:																			
April 1	1, 442	4, 236	5, 678	165	633	798	544	2, 006	2, 550	509	152	661	31	170	201	(3)	(3)	(3)	(3)
October 1	1, 375	4, 189	5, 564	197	626	823	459	2, 013	2, 472	491	137	628	27	149	176	(3)	(3)	(3)	(3)
Indiana, Illinois, Kentucky, etc.:																			
April 1	42, 285	26, 022	68, 307	5. 005	4, 591	9, 596	20, 109	18, 040	38, 149	9, 407	1, 091	10, 498	1, 161	506	1, 667	[3] 479	[3] 826	[3] 3, 581	[3] 4, 886
October 1	36, 550	24, 940	61, 490	6, 092	5, 010	11, 102	24, 785	18, 722	43, 507	9, 722	1, 045	10, 767	1, 210	659	1, 869	[3] 462	[3] 657	[3] 3, 657	[3] 4, 776
Minnesota, Wisconsin, N. & S. Dakota:																			
April 1	3, 633	9, 674	13, 307	456	1, 064	1, 520	1, 855	9, 296	11, 151	1, 032	183	1, 215	200	41	241	(4)	(4)	(4)	(4)
October 1	3, 353	9, 126	12, 479	702	1, 287	1, 989	2, 128	10, 612	12, 740	1, 152	183	1, 335	203	63	266	(4)	(4)	(4)	(4)
Oklahoma, Kansas, Missouri, etc.:																			
April 1	20, 078	12, 431	32. 509	1, 281	821	2, 102	10, 416	8, 853	19, 269	2, 979	21	3, 000	1, 486	339	1, 825	[4] 738	[4] 636	[4] 3, 848	[4] 5, 222
October 1	19, 661	12, 509	32, 170	1, 349	968	2, 317	11, 022	9, 159	20, 181	2, 730	21	2, 751	1, 776	356	2, 132	[4] 668	[4] 546	[4] 5, 672	[4] 6, 886
Texas Inland:																			
April 1	10, 293	5, 271	15, 564	772	608	1, 380	3, 731	1, 065	4, 796	1, 195	-------	1, 195	1, 032	587	1, 619	1, 852	[5] 188	12, 532	14, 572
October 1	10, 287	5, 271	15, 558	676	655	1, 331	3, 601	1, 075	4, 676	1, 387	-------	1, 387	1, 119	454	1, 573	1, 854	[5] 218	13, 126	15, 198
Texas Gulf:																			
April 1	50, 339	7, 580	57, 919	5, 499	682	6, 181	19, 478	2, 830	22, 308	10, 362	188	10, 550	2, 274	-------	2, 274	786	1, 300	16, 244	18, 330
October 1	48, 758	6, 358	55, 116	5, 874	999	6, 873	21, 644	3, 617	25, 261	9, 474	286	9, 760	2, 533	-------	2, 533	808	1, 202	21, 955	23, 965

Louisiana Gulf Coast:																		
April 1	17,222	3,628	20,850	3,110	761	3,871	7,544	1,629	9,173	1,650	659	2,309	715	-------	715	193	268	5,961	6,422
October 1	16,174	3,645	19,819	3,030	759	3,789	8,489	1,653	10,142	1,506	648	2,154	1,556	-------	1,556	198	250	6,417	6,865
Arkansas, Louisiana Inland, etc.:																		
April 1	2,369	6,570	8,939	739	776	1,515	1,045	2,056	3,101	339	-------	339	34	162	196	226	(6)	3,287	3,513
October 1	2,130	6,902	9,032	329	840	1,169	1,056	2,234	3,290	399	-------	399	114	370	484	216	(6)	4,249	4,465
New Mexico:																		
April 1	704	449	1,153	49	43	92	167	165	332	78	-------	78	157	40	197	237	(5)	1,051	1,288
October 1	665	452	1,117	55	43	98	152	162	314	140	-------	140	192	40	232	240	(5)	1,045	1,285
Rocky Mountain:																		
April 1	10,196	2,677	12,873	477	122	599	3,657	1,571	5,228	2,486	-------	2,486	1,339	103	1,442	194	93	274	561
October 1	9,295	2,726	12,021	870	122	992	3,809	1,632	5,441	2,159	-------	2,159	863	83	946	235	98	274	607
West Coast:																		
April 1	44,821	16,994	61,815	3,309	1,167	4,476	18,621	11,461	30,082	15,231	13,354	28,585	2,603	232	2,835	110	648	850	1,608
October 1	41,717	17,802	59,019	3,045	1,341	4,386	19,390	12,163	31,553	20,274	13,370	33,644	2,433	268	2,701	107	731	850	1,688
United States:																		
April 1	232,669	158,272	390,941	24,713	30,496	55,209	108,978	129,399	238,377	53,430	33,411	86,841	11,975	2,788	14,763	4,916	4,353	49,647	58,916
October 1	216,541	157,623	374,164	26,832	32,195	59,027	122,095	135,322	257,417	57,504	32,869	90,373	12,751	3,061	15,812	4,889	4,125	59,337	68,351

See footnotes at end of table.

TABLE 37.—Capacity of storage tanks for finished petroleum products and capacity of underground storage facilities for liquefied gases, at refineries, gasoline plants, bulk terminals [1] and tank farms—Continued

(Thousand barrels)

Refinery district and date	Gasoline			Kerosine			Distillate fuel oil			Residual fuel oil			Military jet fuel			Liquefied petroleum gases			
																Aboveground		Underground	
	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At refineries	At bulk terminals	Total	At plants and terminals	At refineries	At plants, terminals and refineries	Total
1962:																			
East Coast:																			
April 1	25,899	59,011	84,910	3,644	18,575	22,219	20,234	68,533	88,767	7,247	16,674	23,921	828	623	1,451	[2] 101	[2] 336	[2] 1,920	[2] 2,357
October 1	23,062	56,739	79,801	4,560	18,282	22,842	22,951	70,285	93,236	7,369	17,909	25,278	574	451	1,025	[2] 101	[2] 226	[2] 1,920	[2] 2,247
Appalachian No. 1:																			
April 1	2,677	6,597	9,274	281	907	1,188	1,323	4,166	5,489	546	428	974	40	-------	40	(2)	(2)	(2)	(2)
October 1	2,599	6,560	9,159	256	982	1,238	1,566	4,206	5,772	533	246	779	70	-------	70	(2)	(2)	(2)	(2)
Appalachian No. 2:																			
April 1	1,568	4,144	5,712	143	561	704	462	2,218	2,680	518	67	585	27	169	196	(3)	(3)	(3)	(3)
October 1	1,315	4,235	5,550	329	639	968	631	2,342	2,973	399	67	466	27	169	196	(3)	(3)	(3)	(3)
Indiana, Illinois, Kentucky, etc.:																			
April 1	41,159	27,577	68,736	5,594	4,780	10,374	20,588	19,114	39,702	9,408	963	10,371	1,634	596	2,230	[3] 466	[3] 625	[3] 4,213	[3] 5,304
October 1	36,209	25,727	61,936	6,358	4,851	11,209	23,898	19,589	43,487	10,224	1,268	11,492	1,706	692	2,398	[3] 466	[3] 700	[3] 4,348	[3] 5,514
Minnesota, Wisconsin, N. & S. Dakota:																			
April 1	4,011	9,568	13,579	607	1,434	2,041	2,965	9,893	12,858	1,568	183	1,751	203	68	271	(4)	(4)	(4)	(4)
October 1	3,776	9,410	13,186	778	1,486	2,264	2,406	10,934	13,340	1,584	183	1,767	213	63	276	(4)	(4)	(4)	(4)
Oklahoma, Kansas, Missouri, etc.:																			
April 1	20,600	14,027	34,627	1,194	867	2,061	9,803	8,419	18,222	2,696	21	2,717	1,668	488	2,156	[4] 701	[4] 512	[4] 6,538	[4] 7,751
October 1	18,662	12,920	31,582	1,540	941	2,481	11,618	9,665	21,283	2,252	21	2,273	1,592	326	1,918	[4] 712	[4] 733	[4] 8,412	[4] 9,857
Texas Inland:																			
April 1	9,813	5,288	15,101	655	774	1,429	3,516	1,236	4,752	1,093	-------	1,093	1,081	360	1,441	1,920	[5] 186	13,786	15,892
October 1	9,254	5,150	14,404	650	789	1,439	3,630	1,166	4,796	1,056	-------	1,056	1,147	439	1,586	1,930	[2] 214	14,942	17,086
Texas Gulf Coast:																			
April 1	48,061	6,291	54,352	5,901	1,130	7,031	19,771	3,682	23,453	9,043	286	9,329	2,731	-------	2,731	792	991	24,728	26,511
October 1	42,190	5,527	47,717	5,650	1,138	6,788	24,009	4,001	28,010	8,954	236	9,190	3,006	-------	3,006	781	868	26,640	28,289

Louisiana Gulf Coast:																			
April 1	18,293	3,675	21,968	2,822	757	3,579	7,084	1,655	8,739	1,689	534	2,223	1,573	-------	1,573	235	[6] 283	6,247	6,765
October 1	16,789	3,656	20,445	2,887	754	3,641	9,731	1,696	11,427	1,766	532	2,298	1,849	-------	1,849	251	[6] 297	6,403	6,951
Arkansas, Louisiana Inland, etc.:																			
April 1	2,291	7,270	9,561	327	717	1,044	1,058	2,071	3,129	308	-------	308	108	400	508	215	(6)	4,320	4,535
October 1	2,278	7,317	9,595	314	771	1,085	942	2,307	3,249	289	-------	289	118	265	383	232	(6)	4,394	4,626
New Mexico:																			
April 1	686	432	1,118	56	43	99	124	161	285	230	-------	230	193	60	253	236	(5)	1,528	1,764
October 1	517	427	944	68	42	110	121	161	282	226	-------	226	193	60	253	233	(5)	1,271	1,504
Rocky Mountain:																			
April 1	9,945	2,808	12,753	582	177	759	3,554	1,746	5,300	2,489	2	2,491	869	163	1,032	238	96	274	608
October 1	9,169	2,803	11,972	825	182	1,007	4,171	1,783	5,954	2,376	2	2,378	857	123	980	192	96	274	562
West Coast:																			
April 1	39,708	15,626	55,334	2,610	1,625	4,235	18,473	11,139	29,612	17,310	12,519	29,829	3,320	245	3,565	108	608	976	1,692
October 1	37,462	16,736	54,198	2,877	2,089	4,966	18,257	11,272	29,529	16,423	12,735	29,158	3,203	277	3,480	108	820	976	1,904
United States:																			
April 1	224,711	162,314	387,025	24,416	32,347	56,763	108,955	134,033	242,988	54,145	31,677	85,822	14,275	3,172	17,447	5,012	3,637	64,530	73,179
October 1	203,282	157,207	360,489	27,092	32,946	60,038	123,931	139,407	263,338	53,451	33,199	86,650	14,555	2,865	17,420	5,006	3,954	69,580	78,540

---

[1] Includes only bulk terminals operated by refinery and pipeline companies.

[2] Figures for Appalachian No. 1 included with those for East Coast.

[3] Figures for Appalachian No. 2 included with those for Indiana, Illinois, etc.

[4] Figures for Minnesota, Wisconsin, etc., included with those for Oklahoma, Kansas, etc.

[5] Figures for New Mexico included with those for Texas Inland.

[6] Figures for Arkansas, Louisiana Inland, etc., included with those for Louisiana Gulf.

VALUE AND PRICE

The average value of crude oil at the wells in 1962 was $2.90 per barrel, a gain of one cent for the year. The total value of the crude oil produced in 1962 was $7,769 million, compared with $7,566 million in 1961.

The posted price for heavy crude oil in California was increased 10 cents per barrel in January. Some downward adjustments of posted prices for a few fields in the gulf coast area of Texas, in northern Louisiana, and in Michigan, occurred during the last half of the year.

TABLE 38.—Value of crude petroleum at wells in the United States, by States

State	1961		1962[1]	
	Total value at wells (thousand dollars)	Average value per barrel	Total value at wells (thousand dollars)	Average value per barrel
Alabama	19,060	$2.75	19,407	$2.59
Alaska	17,652	2.79	31,190	3.04
Arkansas	80,427	2.75	73,376	2.66
California	728,050	2.43	741,430	2.50
Colorado	134,666	2.88	122,285	2.88
Illinois	229,686	2.99	230,429	2.98
Indiana	34,270	2.98	34,893	2.98
Kansas	324,376	2.89	326,141	2.91
Kentucky	54,482	2.97	53,460	2.95
Louisiana:				
Gulf Coast	1,190,341	3.15	1,366,054	3.15
Northern	147,819	3.14	155,220	3.14
Total Louisiana	1,338,160	3.15	1,521,274	3.15
Michigan	55,191	2.92	48,783	2.85
Mississippi	154,220	2.82	151,429	2.78
Montana	74,793	2.42	76,690	2.42
Nebraska	69,452	2.85	70,326	2.83
New Mexico:				
Southeastern	279,963	2.89	284,516	2.90
Northwestern	42,179	2.69	28,617	2.70
Total New Mexico	322,142	2.86	313,133	2.88
New York	7,892	4.76	8,229	4.60
North Dakota	64,333	2.72	69,201	2.75
Ohio	17,425	3.09	15,705	3.10
Oklahoma	561,866	2.91	579,959	2.92
Pennsylvania	26,579	4.71	23,878	4.57
Texas:[2]				
Gulf Coast	551,660	3.26	561,186	3.26
East Texas Proper	153,036	3.15	140,058	3.10
West Texas	1,222,550	2.86	1,220,262	2.88
Other districts	864,131	2.94	874,630	2.96
Total Texas	2,791,377	2.97	2,796,136	2.99
Utah	91,075	2.75	84,841	2.74
West Virginia	11,426	4.14	13,380	4.00
Wyoming	354,843	2.50	361,466	2.49
Other States[3]	2,139	2.31	1,781	2.11
Total United States	7,565,582	2.89	7,768,822	2.9

[1] Preliminary figures.

[2] Texas Railroad Commission divisions.

[3] Arizona, Florida, Missouri, Nevada, South Dakota, Tennessee, and Virginia.

TABLE 39.—Posted price per barrel of petroleum at wells in the United States in 1962, by grade, with data of change

Date	Pennsylvania Grade		Corning Grade	Western Kentucky	Indiana-Illinois	Coldwater, Mich.	Oklahoma-Kansas	
	Bradford and Allegheny Districts	In southwest Pennsylvania					34°-34.9°	36°-36.9°
Jan. 1	$4.63	$4.08	$2.77	$3.00	$3.00	$2.95	$2.91	$2.97
July 16						2.70		
Sept. 24						2.80		

Date	Panhandle Texas (Carson, Gray, Hutchinson, and Wheeler Counties) 35°-36.9°	West Texas 30°-30.9° (sweet)	Lea County N. Mex. 30°-30.9°	South Texas, Mirando 24°-24.9°	East Texas	Gulf Coast			
						Conroe Tex.	Texas		Louisiana 30°-30.9°
							30°-30.9°	20°-20.9°	
Jan. 1	$2.80	$2.81	$2.65	$3.23	$3.10	$3.53	$3.20	$3.00	$3.10
Aug. 24						3.35			
Sept. 7							3.10	2.90	

Date	Caddo-Pine Island, La. 36°-36.9°	Magnolia-Smackover, Limestone Ark. 31°-31.9°	Elk Basin, Wyo (Incl. Montana) 30°-30.9°	California			
				Coalinga 32°-32.9°	Kettleman Hills 37°-37.9°	Midway Sunset 19°-19.9°	Wilmington 24°-24.9°
Jan. 1	$3.07	$2.67	$2.63	$2.96	$3.21	$2.19	$2.58
Jan. 22						2.29	2.60
Feb. 9	2.97						

Source: Platt's Oil Price Handbook.

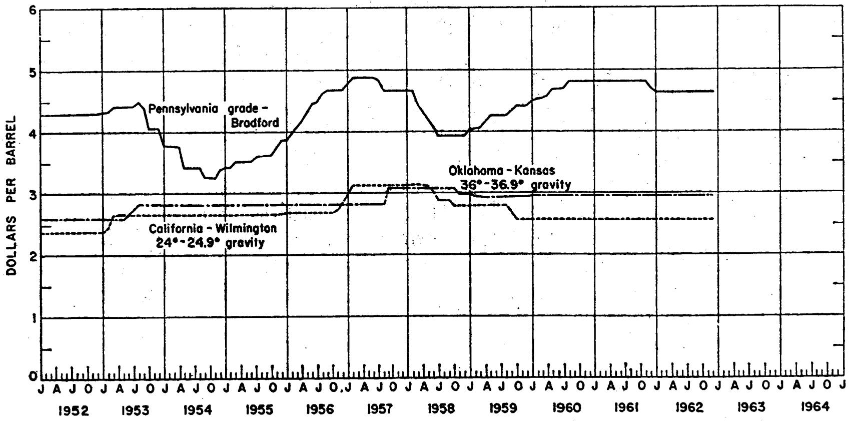


FIGURE 5.—Posted prices of selected grades of crude petroleum in the United States, 1952–62, by months.

REFINED PRODUCTS

GENERAL REVIEW

Petroleum is consumed in many finished products that must be considered individually. Competition with other fuels and economic and climatic conditions influence the consumption.

Gasoline is consumed principally in highway transport, aviation, and mechanized farming. The demand for kerosine (a product defined as meeting lamp-oil specifications for color and flashpoint) has changed drastically within the past few years. This product was losing sales to electricity and liquefied petroleum, especially in rural areas, but the ability of the commercial jet aircraft to use straight kerosine as fuel has opened a vast new market. Distillate fuel oil, including light diesel oils, is used for space heating and for diesel locomotive fuel and has nearly replaced residual fuel oil and coal in railroad use. Residual fuel oil usually sells for less than crude oil at the refineries and competes directly with natural gas and coal for heavy-fuel uses. As it cannot be moved by pipeline, its distribution depends on cheap water transport and limited tank-car movement. Therefore, it cannot normally compete with coal in coal-producing areas. Liquefied gases, in competition with kerosine and light distillate fuel oil in domestic use, are gaining in importance as fuel in internal combustion engines and as the initial raw material in synthesizing many petrochemicals. Jet fuels (a blend of gasoline, kerosine, and distillate fuel oils) have replaced gasoline in military combat aircraft.

The total demand for all oils increased 4.2 percent in 1962 to 10,396,000 barrels daily. This is the largest percentage increase since 1956. Domestic demand averaged 10,228,000 barrels daily, a gain of 4.3 percent. Exports, continuing to decline, averaged 168,000 barrels daily, 3.4 percent less than in 1961.

While the total domestic demand in 1962 reflects the general economic upturn in the nations economy, first and fourth quarter demands, which increased 6.8 percent and 4.8 percent, respectively, show the effects of the 5 percent colder than normal weather in these quarters. Domestic demand in the second quarter increased 3.3 percent, and in the third quarter, 2.1 percent.

Military purchases from domestic sources in 1962 averaged 475,000 barrels daily, compared with 439,000 in 1961.

The new supply of refined products comprises the refinery input of crude oil, the production of natural-gas liquids, a small quantity of motor benzol derived from coal, and imports of refined products from other countries. Crude runs to stills, production of natural-gas liquids, and imports exceeded demand and resulted in a stock increase of 10.1 million barrels.

The higher yields from crude of both kerosine and military jet fuel in 1962 (an increase from 4.7 percent in 1961 to 5.0 percent for kerosine, and from 3.1 to 3.3 percent for military jet fuel) reflect the fast growing demand for commercial and military jet fuel. The yield of residual fuel oil declined from 10.5 percent in 1961 to 9.6 percent. According to the Bureau of Labor Statistics, the wholesale price index for refined products in 1962 was 98.2, compared with 99.3 in 1961. The average wholesale price of the four principal products—gasoline, kerosine, distillate fuel oil, and residual fuel oil—was 9.13 cents per gallon in 1962 compared with 9.21 cents in 1961.

TABLE 40.—Salient statistics of the major refined petroleum products in the United States

(Thousand barrels)

	1958	1959	1960	1961	1962[1]
Gasoline and naphtha:					
Production, total	1, 439, 511	1, 488, 860	1, 522, 497	[2] 1, 534, 462	[2] 1, 581, 859
From crude	1, 274, 687	1, 320, 107	1, 343. 341	1, 344, 819	1, 387, 706
From natural-gas liquids	164, 408	168, 429	178, 881	189, 474	194, 062
Benzol, etc. blended	416	324	275	169	91
Imports	13, 773	13, 358	9, 790	10, 685	13, 970
Exports	27, 403	16. 743	13, 456	8, 976	6, 454
Stocks, end of year	186. 760	187, 613	194, 774	184, 167	190. 138
Domestic demand	1, 435, 897	1, 485, 277	1, 511, 670	1, 533, 173	1, 583, 404
Kerosine:					
Production, total	111, 302	111, 530	136, 842	142, 690	157, 379
From crude	110, 008	110, 662	135, 772	141, 410	156, 373
From natural-gas liquids	1, 294	868	1, 070	1, 280	1, 006
Imports	34	114	68	2, 964	6, 269
Exports	1, 217	944	689	231	336
Stocks, end of year	26, 040	26, 856	31, 445	32, 433	31, 725
Domestic demand	113, 279	109, 919	132, 499	144, 435	[3] 164, 020
Distillate fuel oil:					
Production, total	632, 178	679, 641	668, 684	696, 622	720, 087
From crude	631, 405	678, 938	667, 050	696, 015	719, 590
From natural-gas liquids	773	703	1, 634	607	497
Crude used directly as distillate	950	970	1, 001	851	1, 198
Imports	14, 892	17, 658	12, 771	17, 377	11, 485
Exports	18, 942	12, 734	9, 897	6, 931	8, 198
Stocks, end of year	125, 101	151, 164	138, 455	152, 018	144, 505
Domestic demand	653, 426	659, 983	685, 268	694, 356	732, 085
Residual fuel oil:					
Production	363, 358	347, 900	332, 147	315, 577	295, 679
Crude used directly as residual	10, 965	7, 386	3, 948	3, 854	3, 797
Imports	182. 036	222, 571	233, 208	243, 268	263, 903
Exports	25, 743	20, 815	18, 495	14, 022	12, 870
Stocks, end of year	59. 508	53, 501	44, 870	44, 869	49, 996
Domestic demand	531, 067	563, 464	559, 439	548, 678	545, 382
Military jet fuel:					
Production, total	74, 700	93, 691	89, 109	95, 923	102, 974
From gasoline	53, 195	64, 225	65, 255	70, 436	75, 880
From kerosine	14, 516	19, 555	14, 004	13, 200	14, 673
From distillate	5, 965	9, 153	8, 989	11, 574	11, 716
From natural-gas liquids	1, 024	758	861	713	705
Imports	20, 810	13, 572	12, 372	10, 045	10, 897
Exports	211	173	113	122	82
Stocks, end of year	5, 871	8, 758	6, 870	8, 280	9, 668
Domestic demand	94, 177	104, 228	102, 803	104, 436	112, 401
Lubricants:					
Production	51, 298	56, 111	59, 389	59, 254	61, 467
Imports	----------	----------	22	14	28
Exports, total	13, 003	13, 972	15, 811	17, 094	17, 702
Grease	349	392	393	363	401
Oil	12, 654	13, 580	15, 418	16, 731	17, 301
Stocks, end of year	9, 687	8, 950	12, 303	12, 943	13, 130
Domestic demand	39, 472	42, 878	42, 676	41, 534	43, 606
Wax (1 barrel=280 pounds):					
Production	5, 252	5, 630	5, 896	5, 781	5, 353
Imports	5	21	6	2	----------
Exports	911	1, 031	1, 333	1, 237	1, 429
Stocks, end of year	712	774	905	1, 061	1, 020
Domestic demand	4, 300	4, 558	4, 438	4, 390	3, 965
Coke (5 barrels=1 short ton):					
Production, total	37, 808	41, 117	60, 010	75, 333	78, 724
Marketable coke	22, 620	23, 395	26, 057	30, 480	31, 624
Catalyst coke	15, 188	17. 722	33, 953	44, 853	47, 100
Exports	4, 405	4, 680	6, 856	7, 270	7, 454
Stocks, end of year	4, 818	5, 705	4, 387	5, 316	5, 880
Domestic demand	31, 119	35, 550	54, 472	67, 134	70, 706
Asphalt (5.5 barrels=1 short ton):					
Production	89, 380	97, 643	98, 671	101, 819	109, 576
Imports (including natural)	7, 478	6, 869	6, 143	6, 609	6, 637
Exports	1, 364	935	924	667	875
Stocks, end of year	9, 757	10, 948	12, 991	12, 999	14, 252
Domestic demand	96, 200	102, 386	104, 696	107, 753	114, 085

See footnotes at end of table.

TABLE 40.—Salient statistics of the major refined petroleum products in the United States—Continued

	1958	1959	1960	1961	1962 [1]
Road oil:					
Production	5,925	6,493	5,970	5,820	7,079
Stocks, end of year	417	653	743	761	875
Domestic demand	6,095	6,257	5,880	5,802	6,965
Still gas:					
Production	125,951	126,958	129,480	127,537	130,829
Liquefied gases (includes ethane):					
Production [4]	57,623	68,692	77,578	78,947	76,826
Transfers of liquefied gas [5] from natural gasoline	123,194	146,415	152,173	159,371	178,312
Imports	(6)	(6)	1,631	1,806	2,248
Exports	2,827	2,252	2,988	3,541	3,874
Stocks, end of year	2,207	2,520	3,623	6,298	4,769
Domestic demand	177,696	212,542	227,291	233,908	255,041
Miscellaneous:					
Production, total	20,178	23,303	25,852	28,375	31,883
From crude	18,718	21,854	24,358	26,267	29,794
From natural-gas liquids	1,460	1,449	1,494	2,108	2,089
Imports	------	4	47	------	------
Exports	266	262	257	245	237
Stocks, end of year	2,409	2,281	2,846	2,832	3,366
Domestic demand	19,314	23,173	25,208	28,144	31,112
Other unfinished oils:					
Rerun (net)	32,493	25,868	22,094	21,202	27,733
Imports	33,554	23,072	16,478	25,348	32,516
Stocks, end of year	70,027	67,231	61,615	79,366	84,149
Shortage or (overage)	(23,192)	(31,509)	(53,282)	(65,429)	(63,901)

[1] Preliminary figures.
[2] Excludes unfinished gasoline which is considered as unfinished oils.
[3] Sales of commercial jet fuel: PAD. Districts I–IV, 46,486,000 barrels; District V, 19,221,000 barrels.
[4] Liquefied refinery gases (LR-gases).
[5] Liquefied petroleum gases (LP-gases).
[6] Included with imports of gasoline.

TABLE 41.—Input and output of petroleum products at refineries in the United States

(Thousand barrels)

	1958	1959	1960	1961	1962[1]
Input:					
Crude petroleum:					
Domestic	2,444,229	2,565,504	2,581,568	2,604,127	2,659,826
Foreign	345,175	352,157	370,956	383,031	409,805
Total crude petroleum	2,789,404	2,917,661	2,952,534	2,987,158	3,069,631
Natural-gas liquids	136,853	152,999	166,518	169,278	182,756
Benzol	416	324	275	169	91
Total input	2,926,673	3,070,984	3,119,327	3,156,605	3,252,478
Output:					
Gasoline	1,411,956	1,473,430	1,510,134	[2] 1,514,266	[2] 1,570,553
Kerosine[3]	110,008	110,662	135,772	141,410	156,373
Distillate fuel oil[3]	631,405	678,938	667,050	696,015	719,590
Residual fuel oil	363,358	347,900	332,147	315,577	295,679
Military jet fuel[3]	73,676	92,933	88,248	95,210	102,269
Lubricants	51,298	56,111	59,389	59,254	61,467
Wax[4]	5,252	5,630	5,896	5,781	5,353
Coke[4]	37,808	41,117	60,010	75,333	78,724
Asphalt[4]	89,380	97,643	98,671	101,819	109,576
Road oil	5,925	6,493	5,970	5,820	7,079
Still gas	125,951	126,958	129,480	127,537	130,829
Liquefied gases	57,623	68,692	77,578	78,947	76,826
Other finished products[3]	18,718	21,854	24,358	26,267	29,794
Other unfinished oils (net)	[5] −32,493	[5] −25,868	[5] −22,094	[5] [6] −21,202	[5] [6] −27,733
Shortage (or overage)[7]	−23,192	−31,509	−53,282	−65,429	−63,901
Total output	2,926,673	3,070,984	3,119,327	3,156,605	3,252,478

[1] Preliminary figures.

[2] Excludes unfinished gasoline which is considered as unfinished oils.

[3] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

[4] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton.

[5] Negative quantity: represents net excess of unfinished oils rerun over unfinished oil produced.

[6] Includes unfinished gasoline.

[7] Includes losses or gains in volume during processing.

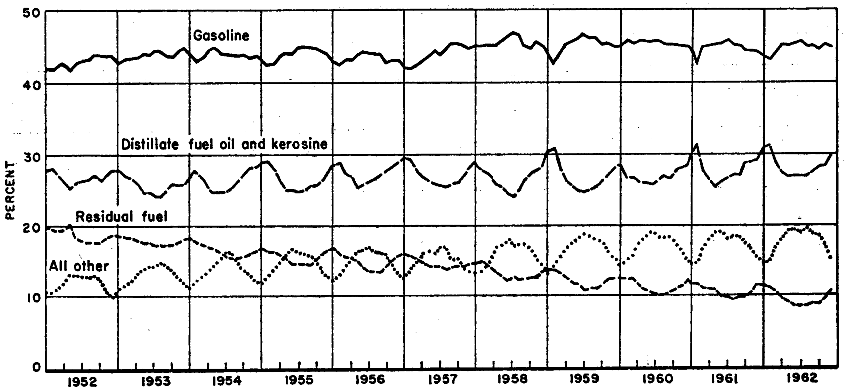


FIGURE 6.—Yields of principal products from crude runs to stills in the United States, 1952–62, by months.

TABLE 42.—Percentage yields of refined petroleum products from crude oil in the United States [1]

Product	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962 [2]
Finished products:										
Gasoline	43.9	43.8	44.0	43.4	43.8	45.2	44.9	45.2	44.7	44.8
Kerosine	4.8	4.8	4.3	4.2	3.8	3.9	3.8	4.6	4.7	5.0
Distillate fuel oil	20.7	21.3	22.0	22.9	23.1	22.4	23.1	22.4	23.1	23.2
Residual fuel oil	17.6	16.4	15.3	14.7	14.4	12.9	11.8	11.2	10.5	9.6
Military jet fuel	1.4	1.8	2.1	2.3	2.2	2.6	3.2	3.0	3.1	3.3
Lubricating oil	2.1	2.1	2.0	2.0	1.9	1.8	1.9	2.0	2.0	2.0
Wax	.2	.2	.2	.2	.2	.2	.2	.2	.2	.1
Coke	.8	1.0	1.0	1.1	1.2	1.3	1.4	2.0	2.5	2.6
Asphalt	2.8	2.9	3.0	3.1	3.0	3.2	3.3	3.3	3.4	3.5
Road oil	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2
Still gas	4.0	4.0	4.3	4.2	4.3	4.4	4.3	4.4	4.2	4.3
Liquefied gases	1.3	1.3	1.6	1.8	1.9	2.0	2.3	2.6	2.7	2.5
Other finished products	.4	.4	.4	.4	.5	.7	.7	.8	.8	.9
Shortage	−.3	−.3	−.5	−.6	−.5	−.8	−1.1	−1.9	−2.1	−2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Other unfinished oils added to crude in computing yields.
[2] Preliminary figures.

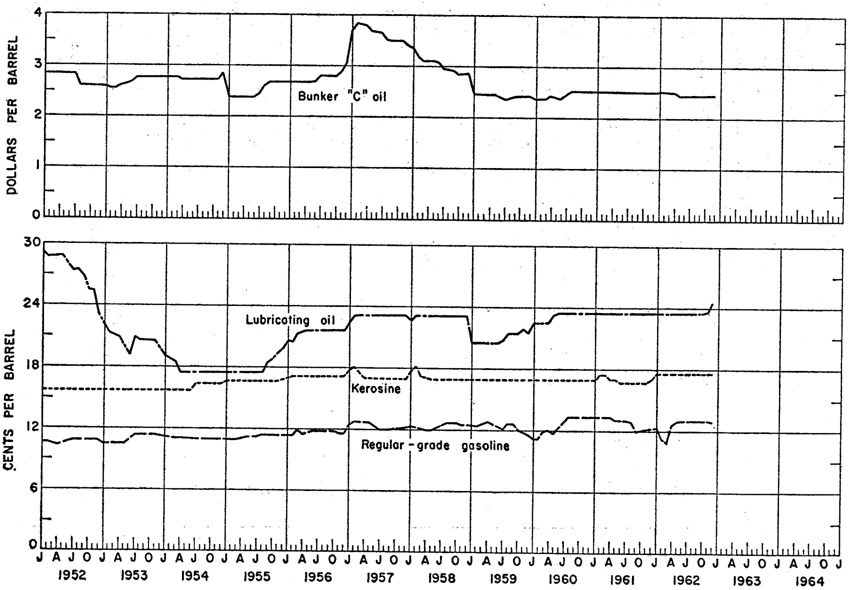


FIGURE 7.—Prices of Bunker "C" oil at New York Harbor, bright stock at Oklahoma refineries, tank-wagon kerosine at Chicago, and regular-grade gasoline at refineries in Oklahoma, 1952–62, by months.

TABLE 43.—Stocks of refined petroleum products in the United States at end of month

(Thousand barrels)

Product	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1961:												
Gasoline [1]	197, 874	208, 759	209, 462	208, 374	198, 906	183, 743	182, 517	178, 536	173, 272	173, 883	174, 015	184, 167
Kerosine	27, 365	24, 471	25, 666	27, 348	28, 384	30, 305	32, 440	33, 929	35, 911	37, 257	36, 224	32, 433
Distillate fuel oil	108, 097	97, 298	87, 950	85. 003	93, 636	109, 513	129, 631	150, 893	165, 445	177, 921	174, 192	152, 018
Residual fuel oil	42, 934	42, 635	40, 889	41, 848	44, 137	47, 362	50, 242	48, 771	50, 341	48, 969	46, 694	44, 869
Military jet fuel	5, 991	6, 417	7, 131	7, 783	7, 621	7, 876	8, 245	8, 455	7, 923	7, 690	7, 797	8. 280
Lubricating oil	12, 376	12, 791	12, 695	13, 388	13, 072	12, 735	12, 882	12, 560	12, 400	12, 279	12, 326	12, 943
Wax	881	894	930	1, 005	990	945	1, 013	1, 039	1, 048	999	1, 014	1, 061
Coke	4, 665	4, 663	5, 126	5, 508	5, 611	5, 553	5, 676	5, 560	5, 474	5, 405	5, 341	5, 316
Asphalt	15, 200	17, 647	19, 189	21, 638	21, 269	19, 275	17, 700	14, 125	12, 145	10, 488	10. 882	12, 999
Road oil	691	809	1, 084	1, 327	1, 573	1, 508	1, 315	1, 018	892	730	748	761
Liquefied refinery gases	3, 718	3, 791	4, 186	4, 475	5, 714	5, 919	6, 165	6, 165	6, 293	6, 523	6, 715	6, 298
Miscellaneous	3, 018	2, 913	2, 765	2, 883	2, 780	2. 869	2, 783	2, 875	2, 858	2, 954	2, 835	2, 832
Other unfinished oils	75, 878	73, 870	77, 457	82, 880	86, 668	90, 155	89, 248	86, 738	84, 179	85, 814	84, 214	79, 366
Total 1961	498, 688	496, 958	494, 530	503, 410	510. 361	517, 758	539. 857	550. 664	558, 181	570, 912	562, 997	543, 343
1962: [2]												
Gasoline [1]	195, 592	205, 745	205, 963	200, 425	192, 366	185, 534	183, 067	173, 022	179, 896	176, 408	175. 415	190, 138
Kerosine	26, 386	25, 295	23, 315	24, 248	27, 264	30, 112	33. 204	35, 682	36, 682	37, 333	35, 349	31, 725
Distillate fuel oil	121, 041	99, 952	86, 497	88, 310	102, 317	121, 496	140, 630	163, 025	176, 192	185, 222	170. 221	144. 505
Residual fuel oil	41, 605	39, 457	37, 127	39, 267	40, 976	44, 891	50, 662	54, 085	56, 513	54, 077	51, 154	49, 996
Military jet fuel	8, 092	8, 057	8, 317	8, 505	8, 251	8, 162	8, 055	8, 656	8, 405	9, 413	10, 768	9, 668
Lubricating oil	13, 133	13, 391	13, 631	13, 282	12, 672	12, 463	12, 490	12, 176	12, 180	12, 598	12, 546	13. 130
Wax	1, 043	960	927	911	919	863	986	987	986	978	951	1, 020
Coke	5, 312	5, 265	5, 356	5, 153	5, 072	5, 059	5, 240	5. 052	5, 219	5, 186	5, 398	5. 880
Asphalt	14. 665	16, 554	19, 030	20, 788	21, 294	19, 918	18, 417	14, 432	13, 579	11, 377	11, 603	14, 252
Road oil	807	1, 065	1, 439	1, 498	1, 557	1, 574	1, 235	1, 003	988	815	815	875
Liquefied refinery gases	5, 530	5, 272	4, 999	5, 210	5, 925	6, 348	6, 428	6, 251	6, 351	5, 864	5, 483	4, 769
Miscellaneous	3, 070	2, 808	3, 218	3, 213	3, 168	3, 133	3, 386	3, 358	3, 370	3, 646	3, 416	3. 366
Other unfinished oils	79, 412	80, 860	78, 396	84, 378	85, 662	87. 896	84, 751	85, 798	83, 524	85, 534	87, 491	84, 149
Total 1962	515, 688	504, 681	488, 215	495, 188	507, 443	527, 449	548, 551	563, 527	583, 885	588, 451	570, 610	553, 473

---

[1] Excludes unfinished gasoline which is considered as unfinished oils.
[2] Preliminary figures.

TABLE 44.—Input and output of petroleum products at refineries in the United States, by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Input:													
Crude petroleum	259, 349	236, 756	250, 964	234, 577	248, 973	239, 579	256, 974	262, 109	239, 280	253, 534	246, 142	258, 921	2, 987, 158
Natural-gas liquids	15, 003	12, 556	13, 388	13, 010	13, 811	13, 566	13, 966	13, 939	13, 296	15, 191	15, 898	15, 654	169, 278
Benzol	14	15	13	13	18	12	17	11	13	15	15	13	169
Total input	274, 366	249, 327	264, 365	247, 600	262, 802	253, 157	270, 957	276, 059	252, 589	268, 740	262, 055	274, 588	3, 156, 605
Output:													
Gasoline [1]	129, 947	114, 767	125, 298	117, 234	125, 537	121, 759	133, 849	134, 664	123, 250	127, 826	126, 890	133, 245	1, 514, 266
Kerosine [2]	13, 857	12, 040	12, 679	10, 555	9, 921	9, 466	11, 125	11, 325	11, 259	13, 134	12, 450	13, 599	141, 410
Distillate fuel oil [2]	64, 433	63, 248	55, 967	49, 861	52, 868	52, 503	58, 234	61, 208	54, 571	59, 898	59, 508	63, 716	696, 015
Residual fuel oil	29, 894	27, 758	27, 383	24, 990	26, 551	23, 318	25, 825	25, 212	23, 851	25, 106	25, 713	29, 977	315, 577
Military jet fuel	6, 709	6, 674	8, 878	7, 973	8, 301	7, 539	8, 072	8, 862	7, 967	7, 532	8, 154	8, 549	95, 210
Lubricating oil	4, 716	4, 723	5, 025	5, 065	5, 276	4, 562	5, 153	5, 144	4, 547	5, 075	5, 020	4, 948	59, 254
Wax [3]	475	481	545	522	454	450	498	496	460	444	493	463	5, 781
Coke [3]	6, 302	5, 607	6, 187	6, 238	6, 090	6, 181	6, 624	6, 712	5, 916	6, 458	6, 348	6, 670	75, 333
Asphalt [3]	4, 979	4, 529	5, 925	7, 691	9, 395	10, 878	11, 798	11, 899	10, 865	10, 518	7, 551	5, 791	101, 819
Road oil	168	188	358	392	717	914	991	975	525	247	172	173	5, 820
Still gas	10, 114	9, 764	10, 485	9, 821	11, 118	10, 537	11, 972	11, 418	10, 748	10, 563	10, 328	10, 669	127, 537
Liquefied refinery gases	6, 947	6, 413	6, 864	6, 617	7, 140	6, 604	6, 171	6, 439	5, 889	6, 254	6, 557	7, 052	78, 947
Miscellaneous [2]	2, 168	1, 884	2, 167	2, 174	2, 568	2, 266	1, 854	2, 159	2, 233	2, 357	2, 098	2, 339	26, 267
Other unfinished oils (net)	[4] −1, 099	[4] −3, 473	1, 902	3, 466	1, 717	1, 072	[4] −4, 453	[4] −4, 823	[4] −4, 360	[4] −833	[4] −3, 618	[4] −6, 700	[4] −21, 202
Shortage or (overage)	(5, 244)	(5, 276)	(5, 298)	(4, 999)	(4, 851)	(4, 892)	(6, 755)	(5, 631)	(5, 132)	(5, 839)	(5, 609)	(5, 903)	(65, 429)
Total output	274, 366	249, 327	264, 365	247, 600	262, 802	253, 157	270, 957	276, 059	252, 589	268, 740	262, 055	274, 588	3, 156, 605
1962: [5]													
Input:													
Crude petroleum	265, 277	241, 965	253, 988	242, 961	256, 283	258, 782	264, 437	262, 528	252, 663	256, 073	251, 025	263, 649	3, 069, 631
Natural-gas liquids	15, 288	13, 493	14, 409	13, 616	14, 743	14, 482	15, 308	15, 603	15, 716	16, 801	16, 474	16, 823	182, 756
Benzol	9	5	4	10	6	4	3	4	10	12	13	11	91
Total input	280, 574	255, 463	268, 401	256, 587	271, 032	273, 268	279, 748	278, 135	268, 389	272, 886	267, 512	280, 483	3, 252, 478

Output:													
Gasoline [1]	131,820	118,204	128,804	122,265	131,170	132,138	138,781	135,520	132,075	131,722	130,014	138,040	1,570,553
Kerosine [2]	14,507	14,664	12,726	11,051	11,359	11,458	13,243	12,516	12,319	13,436	13,606	15,488	156,373
Distillate fuel oil [2]	68,406	61,151	62,080	54,323	57,503	58,464	59,312	58,951	58,136	59,249	57,311	64,704	719,590
Residual fuel oil	30,371	26,543	26,862	22,897	23,312	22,219	23,208	22,893	23,139	22,490	23,584	28,161	295,679
Military jet fuel [2]	7,564	7,072	8,621	8,628	9,191	8,954	8,360	9,661	8,783	9,406	9,181	6,848	102,269
Lubricating	5,019	4,727	4,962	5,262	5,026	5,081	5,293	5,046	5,329	5,324	4,971	5,427	61,467
Wax [3]	430	393	490	427	499	423	490	469	427	458	412	435	5,353
Coke [3]	6,597	6,092	6,692	5,852	6,687	6,959	6,694	6,847	6,511	6,617	6,335	6,841	78,724
Asphalt [3]	4,779	5,079	6,955	8,493	11,277	11,668	12,683	12,731	11,826	10,393	7,580	6,112	109,576
Road oil	124	306	623	410	707	1,046	1,077	1,184	727	395	257	223	7,079
Still gas	10,523	9,523	10,771	10,261	11,321	11,542	11,985	11,598	11,060	11,117	10,293	10,835	130,829
Liquefied refinery gases	6,535	6,008	6,699	6,292	6,672	6,461	6,688	6,256	6,208	6,047	6,107	6,853	76,826
Miscellaneous [2]	2,304	1,992	2,522	2,422	2,594	2,536	2,746	2,580	2,434	2,796	2,593	2,275	29,794
Other unfinished oils (net)	[4] −2,693	[4] −1,049	[4] −5,196	3,307	[4] −1,355	[4] −463	[4] −5,524	[4] −3,087	[4] −4,991	[4] −1,042	514	[4] −6,154	[4] −27,733
Shortage or (overage)	(5,712)	(5,242)	(5,210)	(5,303)	(4,931)	(5,218)	(5,288)	(5,030)	(5,594)	(5,522)	(5,246)	(5,605)	(63,901)
Total output	280,574	255,463	268,401	256,587	271,032	273,268	279,748	278,135	268,389	272,886	267,512	280,483	3,252,478

---

[1] Excludes unfinished gasoline which is considered as unfinished oils.

[2] Production at natural-gasoline plants shown as direct "transfers" and omitted from the input and output at refineries.

[3] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton.

[4] Negative quantity; represents net excess of unfinished oils rerun over unfinished oil produced.

[5] Preliminary figures.

TABLE 45.—Input and output of petroleum products at refineries in the United States, by districts

(Thousand barrels)

	East Coast	Appalachian No. 1	Appalachian No. 2	Indiana, Illinois, Kentucky, etc.	Minnesota, Wisconsin, etc.	Oklahoma, Kansas, etc.	Texas Inland	Texas Gulf Coast	Louisiana Gulf Coast	Arkansas-Louisiana-Inland, etc.	New Mexico	Rocky Mountain	West Coast	Total
1961:														
Input:														
Crude Petroleum	409,923	36,406	35,855	544,776	44,746	262,730	110,872	688,042	255.378	41,115	8,906	103,639	444,770	2,987,158
Natural-gas liquids	1,994	68	54	13,658	969	18,379	24,118	53,739	17,937	8,245	1,038	3,573	25,506	169,278
Benzol	78	--------	--------	17	--------	--------	--------	55	--------	1	--------	18	--------	169
Total input	411,995	36,474	35,909	558,451	45,715	281,109	134,990	741,836	273,315	49,361	9,944	107,230	470,276	3,156,605
Output:														
Gasoline [1]	185,808	15,623	18,898	279,222	21.268	148,002	76,357	354,361	133,875	24,384	4,746	49,470	202,252	1,514,266
Kerosine [2]	12,911	1,396	1,992	27,256	2,019	5,937	4.034	43,746	22,847	1,573	172	1,616	15,911	141,410
Distillate fuel oil [2]	125,142	8,551	6,824	116,782	10,614	64,126	17,802	180,878	59.139	9,157	1,601	23,169	72.230	696,015
Residual fuel oil	53,873	3,701	3,954	55,885	6,426	6,722	7.074	46.176	16,537	2,210	820	12,282	99,917	315,577
Military jet fuel [2]	3,083	226	332	11,457	1,243	14,836	13,189	14,448	9,605	922	1,419	5.817	18,633	95,210
Lubricating oil	7,922	3,077	368	4,896	--------	4,766	174	22,530	7,039	1,939	--------	339	6,204	59.254
Wax [3]	1.983	246	67	407	--------	587	70	1,285	555	--------	--------	73	508	5.781
Coke [3]	13,049	180	395	16,958	1,757	8,578	1,780	13,036	5,092	2,017	43	2,561	9,887	75.333
Asphalt [3]	22,003	1,453	2,399	18,951	1,421	11,297	4,888	7,129	5,356	4,786	454	7,149	14,533	101,819
Road oil	30	--------	5	1,749	196	1.073	--------	5	3	10	--------	1,588	1.161	5,820
Still gas	15,908	1,665	1,909	26,984	1,513	10.632	5,194	23,681	7,675	2,062	242	4,039	26.033	127,537
Liquefied refinery gases	10.345	596	165	8,958	604	6,831	3,567	20.765	14,532	916	147	1,457	10,064	78,947
Miscellaneous [2]	4.236	736	36	1,711	62	1,143	821	7,527	5,062	167	--------	255	4,511	26,267
Other unfinished oils (net)	[4]−32,480	[4]−686	[4]−835	945	[4]−151	501	570	20,328	[4]−2.263	[4]−294	35	[4]−854	[4]−6.018	[4]−21,202
Shortage or (overage)	(11,818)	(290)	(600)	(13,710)	(1,257)	(3,922)	(530)	(14,059)	(11,739)	(488)	265	(1.731)	(5,550)	(65,429)
Total output	411,995	36,474	35,909	558,451	45,715	281,109	134,990	741,836	273,315	49,361	9,944	107,230	470,276	3,156,605
1962: [5]														
Input:														
Crude petroleum	406,223	36,723	35,047	546,649	46,636	270,683	112,979	724,841	270,470	42,153	9,433	110.980	456,814	3,069,631
Natural-gas liquids	2,492	78	140	14,087	1,227	18,790	25,063	63,443	20,060	8,053	1,509	3,920	23,894	182,756
Benzol	65	--------	--------	13	--------	--------	--------	--------	--------	--------	--------	13	--------	91
Total input	408,780	36,801	35,187	560,749	47,863	289,473	138,042	788,284	290,530	50.206	10,942	114,913	480,708	3,252,478

Output:														
Gasoline [1]	187,933	15,305	18,225	278,855	22,833	154,056	81,396	379,681	141,612	24,491	5,416	52,402	208,348	1,570,553
Kerosine [2]	13,636	1,278	2,276	30,515	2,081	7,005	4,294	48,664	24,742	1,967	228	2,220	17,467	156,373
Distillate fuel oil [2]	121,213	8,523	6,302	117,200	10,941	65,980	19,785	192,861	63,910	9,371	1,575	24,531	77,398	719,590
Residual fuel oil	53,451	3,759	3,576	51,211	6,266	7,271	5,851	36,609	15,341	1,958	781	14,197	95,408	295,679
Military jet fuel [2]	3,237	375	335	11,247	1,556	13,981	13,915	18,115	11,987	973	1,443	5,809	19,296	102,269
Lubricating oil	7,929	3,278	427	4,639	----------	4,829	156	24,276	7,230	1,950	----------	312	6,441	61,467
Wax [3]	1,886	283	79	365	----------	601	70	1,030	505	----------	----------	85	449	5,353
Coke [3]	12,846	130	442	16,094	1,751	8,477	1,898	16,322	5,392	2,114	51	2,704	10,503	78,724
Asphalt [3]	25,794	1,502	2,725	20,345	1,411	11,199	4,974	7,115	6,118	5,387	559	6,212	16,235	109,576
Road oil	37	----------	7	1,865	155	1,810	----------	15	4	4	----------	1,919	1,263	7,079
Still gas	15,922	1,837	1,829	26,308	1,554	10,831	4,733	26,118	9,131	2,080	284	4,047	26,155	130,829
Liquefied refinery gases	10,212	601	214	8,125	655	6,601	3,144	21,276	13,299	800	274	1,568	10,057	76,826
Miscellaneous [2]	3,947	675	52	3,981	66	1,830	859	7,419	5,547	179	----------	158	5,081	29,794
Other unfinished oils (net)	[4]−37,958	[4]−659	[4]−845	2,183	[4]−213	[4]−564	[4]−2,445	23,262	[4]−2,631	[4]−534	53	186	[4]−7,568	[4]−27,733
Shortage or (overage)	(11,305)	(86)	(457)	(12,184)	(1,193)	(4,434)	(588)	(14,479)	(11,657)	(534)	278	(1,437)	(5,825)	(63,901)
Total output	408,780	36,801	35,187	560,749	47,863	289,473	138,042	788,284	290,530	50,206	10,942	114,913	480,708	3,252,478

---

[1] Excludes unfinished gasoline which is considered as unfinished oils.

[2] Production at natural-gasoline plants, shown as direct transfers and omitted from the input and output at refineries.

[3] Conversion factors: 280 pounds of wax to the barrel; 5.0 barrels of coke to the short ton; 5.5 barrels of asphalt to the short ton.

[4] Negative quantity; represents net excess of unfinished oils rerun over unfinished oil produced.

[5] Preliminary figures

REFINERY CAPACITY

There were 308 petroleum refineries in the United States on January 1, 1963, with a total installed crude-oil capacity of 10,118,321 barrels daily. Crude-oil throughput capacity under construction at the beginning of the year totaled 238,000 barrels daily (178,300 barrels for additional capacity and 60,400 barrels to replace existing equipment). The capacity of the average refinery to process crude oil increased from 32,492 barrels daily in 1962 to 32,852 barrels in 1963. Two new refineries are under construction and are expected to be placed in operation during the year. One of the new refineries is located in Alaska and the other in Mississippi.

The operating ratio of the petroleum refining industry at the beginning of 1963, as indicated by the ratio of January 1963 crude runs to the total installed operable capacity was 86.8 percent. This compares with an operating ratio of 85.3 percent at the beginning of 1962.

TABLE 46.—**Petroleum refinery capacity in the United States, Jan. 1**

Year	Number of refineries				Crude-oil throughput capacity (barrels per day)				
	Operating	Shutdown	Total	Building	Operating	Shutdown		Total	Building
						Operable	Inoperable		
1958	288	30	318	2	8,939,907	418,400	49,400	9,407,707	185,265
1959	291	22	313	--------	9,450,741	310,705	58,400	9,819,846	108,400
1960	290	20	310	2	9,543,329	299,295	58,800	9,901,424	70,940
1961	289	22	311	--------	9,629,685	368,888	11,500	10,010,073	36,507
1962	287	24	311	1	9,812,248	220,799	72,100	10,105,147	110,350
1963	287	21	308	2	9,814,791	196,130	107,400	10,118,321	178,300

AVIATION GASOLINE

The total demand for aviation gasoline declined 9.6 percent in 1962. Domestic demand for the year was 52.2 million barrels, a decrease of 3.4 million, and exports were 4.5 million barrels, a decrease of 2.6 million. According to refinery reports, deliveries to the military averaged 72,000 barrels daily, over half of the domestic demand for aviation gasoline. The production of all finished grades of aviation gasoline declined during the year, but alkylate production increased from 53.4 million barrels in 1961 to 68.2 million in 1962.

Jet-type fuels are not included in aviation gasoline. The fuel used in commercial jetplanes (mostly straight kerosine) is reported in another section of this chapter under kerosine and that used by the military is reported under the section on jet fuel.

GASOLINE

The total demand for gasoline in 1962 was 1,589.9 million barrels, which included a domestic demand of 1,583.4 million barrels and exports of 6.5 million. This is an increase for the year of 3.1 percent for total demand and 3.3 percent for domestic demand. Exports declined 28.1 percent.

Production.—Gasoline production from crude oil in 1962 totaled 1,387.7 million barrels; from natural-gas liquids, 194.1 million; and from benzol, 0.1 million barrels. Total gasoline production in 1962 was 1,581.9 million barrels, a gain of 3.1 percent for the year.

Yields.—The yield of gasoline from crude oil was 44.8 percent in 1962, compared with 44.7 percent in 1961. With the higher crude runs to stills and increasing volume of gasoline obtained from natural-gas liquids plants, adequate new supply was available without substantial changes in the yield pattern.

Domestic Demand.—The 3.3 percent increase in domestic demand for 1962 was the highest percentage gain reported for gasoline in several years. Demand for the first half was 4.0 percent higher than a year ago; the third quarter gain was only 2.0 percent, but increased to 3.3 percent in the last quarter. Civilian highway use of gasoline, as calculated from data compiled by the Bureau of Public Roads, totaled 1,398.7 million barrels in 1962 compared with 1,347.8 million barrels in 1961. Nonhighway motor vehicles, military motor vehicles, stationary and marine engines, and losses consumed the remainder (132.5 million barrels).

Production and Consumption by States.—Table 50 shows gasoline production, consumption by PAD Districts, and the interdistrict shipments which balance the supply for each district. The consumption data compiled by the American Petroleum Institute exclude special naphtha and offshore military shipments. For comparative purposes in this table, the naphtha has been excluded from gasoline production and stocks. No breakdown by districts is available on the 11.3 million barrels of natural-gas liquids which were blended with gasoline at terminal facilities away from the refineries in 1962; therefore, it has been omitted from the production figures. This roughly offsets the omission of offshore military shipments in consumption data.

Method of Distribution.—Gasoline deliveries by pipeline in 1962 totaled 774.2 million barrels compared with 723.4 million in 1961. Tidewater shipments of gasoline from the gulf coast to the east coast were slightly below the 1961 level, but shipments from the Gulf to the west coast increased from 1.1 million to 2.6 million barrels. Interdistrict barge shipments of gasoline on the Mississippi River were 53.4 million barrels in 1962, 4.2 million barrels more than a year ago. Data on intradistrict barge shipments is not available, but the volume is presumed to be large.

Stocks.—Stocks of gasoline, as reported include those held at refieries, at bulk terminals operated by refineries and pipeline companies, but do not include those held by secondary distributors, by consumers, or in military custody. The Bureau of Mines definition of a bulk-terminal installation is any storage facility operated by refining or pipeline companies which receives its principal products by tanker, barge or pipeline, or any storage point which has a combined capacity for storing refined products of 50,000 barrels or more regardless of transportation means by which products are received.

TABLE 47.—Salient statistics of aviation gasoline in the United States in 1962,[1] by months

(Thousand barrels)

Item	January	February	March	April	May	June	July	August	September	October	November	December	Total
Production:													
By grades:													
Military 115/145	2,149	1,451	2,056	2,022	2,402	1,817	1,917	2,080	1,959	1,563	2,116	1,427	22,959
Military 100/130	93	70	52	83	84	60	54	44	42	68	17	102	769
Commercial 115/145	1,076	1,255	1,170	828	1,223	1,391	1,366	1,248	829	1,306	1,456	1,415	14,563
Commercial 100/130	745	1,042	1,063	1,002	919	882	955	964	709	1,308	874	1,041	11,504
91/98	69	111	60	46	48	93	85	53	52	73	28	40	758
Other grades (incl. commercial 108/135)	281	201	216	243	321	366	370	482	282	271	271	254	3,558
Alkylate (net) [2]	4,770	5,023	5,282	5,519	6,132	6,163	6,532	6,137	6,501	5,359	5,031	5,710	68,159
Total	9,183	9,153	9,899	9,743	11,129	10,772	11,279	11,008	10,374	9,948	9,793	9,989	122,270
Transfers Out: [3]													
Alkylate	4,774	4,254	5,016	5,219	6,085	5,824	6,164	6,103	5,905	5,362	4,989	5,093	64,788
Finished avgas	122	182	96	132	38	71	275	349	34	67	64	115	1,545
Total	4,896	4,436	5,112	5,351	6,123	5,895	6,439	6,452	5,939	5,429	5,053	5,208	66,333
Exports from:													
District 1	3	4	15	23	4	8	11	14	7	102	------	4	195
District 2	------	------	------	------	------	21	20	25	------	28	10	12	116
District 3	266	233	40	386	188	265	334	403	536	382	208	301	3,542
District 4	------	------	------	------	------	------	------	------	------	------	------	------	------
District 5	8	26	12	6	13	182	105	85	52	59	24	28	600
Total	277	263	67	415	205	476	470	527	595	571	242	345	4,453
Stocks:													
By grades:													
Military 115/145	1,755	1,586	1,598	1,265	1,384	1,395	1,129	1,121	1,399	1,424	1,519	1,510	1,510
Military 100/130	150	127	110	123	138	98	97	90	94	91	80	145	145
Commercial 115/145	2,357	2,527	2,397	2,253	2,284	2,561	2,607	2,560	2,490	2,372	2,482	2,863	2,863
Commercial 100/130	2,276	2,402	2,459	2,452	2,344	2,197	2,193	2,204	1,979	2,192	2,061	2,248	2,248
91/98	418	462	453	432	394	410	429	414	397	413	397	388	388
Other grades (incl. commercial 108/135)	720	666	698	618	621	736	709	667	665	747	755	689	689
Alkylate	3,251	3,559	3,516	3,447	3,104	3,159	3,042	2,794	3,045	2,770	2,779	3,039	3,039
Total	10,927	11,329	11,231	10,590	10,269	10,556	10,206	9,850	10,069	10,009	10,073	10,882	10,882

Domestic demand: All grades (incl. Alkylate)	4,710	4,052	4,818	4,618	5,122	4,114	4,720	4,385	3,621	4,008	4,434	3,627	52,229
Total demand: All grades (incl. Alkylate)	4,987	4,315	4,885	5,033	5,327	4,590	5,190	4,912	4,216	4,579	4,676	3,972	56,682
Deliveries:													
To U.S. Military:													
Military 115/145	2,294	1,403	1,699	1,769	1,929	1,579	2,020	1,626	1,247	1,293	1,736	939	19,534
Military 100/130	49	42	46	43	43	32	9	9	7	8	4	4	296
Commercial 115/145	381	173	407	419	513	409	517	665	392	681	488	446	5,491
Commercial 100/130	39	42	33	20	17	15	3	5	46	80	20	4	324
91/98	8	9	5	22	20	5	13	8	3	17	6	11	127
Other grades (incl. commercial 108/135)	34	16	39	39	49	31	24	32	4	17	81	59	425
Total	2,805	1,685	2,229	2,312	2,571	2,071	2,586	2,345	1,699	2,096	2,335	1,463	26,197
To Other Consumers and Exports:													
Military 115/145	286	198	286	564	349	221	159	448	430	242	275	490	3,948
Military 100/130	63	47	23	22	26	62	33	35	31	63	24	23	452
Commercial 115/145	530	907	885	550	675	701	797	622	501	729	852	584	8,333
Commercial 100/130	929	869	960	976	999	1,005	940	942	879	976	978	810	11,263
91/98	72	58	54	44	53	49	49	51	60	36	37	36	599
Other grades (incl. commercial 108/135)	153	90	139	196	264	197	141	187	271	165	142	209	2,154
Alkylate	149	461	309	369	390	284	485	282	345	272	33	357	3,736
Total	2,182	2,630	2,656	2,721	2,756	2,519	2,604	2,567	2,517	2,483	2,341	2,509	30,485
Shipments originating in:													
District 1	159	374	294	257	293	246	481	223	427	221	210	104	3,289
District 2	518	454	533	449	596	669	562	645	379	391	515	318	6,029
District 3	3,121	2,231	2,969	3,183	3,072	2,437	2,693	2,817	2,376	2,973	2,941	2,552	33,365
District 4	85	81	86	97	105	112	149	143	109	131	100	101	1,299
District 5	1,104	1,175	1,003	1,047	1,261	1,126	1,305	1,084	925	863	910	897	12,700
Total	4,987	4,315	4,885	5,033	5,327	4,590	5,190	4,912	4,216	4,579	4,676	3,972	56,682

---

[1] Included in gasoline figures in other tables of this report.

[2] Excludes alkylate produced and blended to finished avgas during the month.

[3] Represents alkylate and a small amount of finished avgas transferred or used in the production of other products, mainly automotive gasoline.

TABLE 48.—Salient statistics of gasoline and naphtha in the United States, 1960 total and 1961–62 by months [1]

(Thousand barrels)

	1961													1960 total
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
Production:														
Finished gasoline from crude oil	111,055	100,254	109,361	101,943	109,564	105,585	116,919	117,650	107,362	109,720	108,369	114,881	1,312,663	1,312,407
Naphtha from crude oil	3,875	1,942	2,536	2,268	2,144	2,596	2,947	3,064	2,579	2,900	2,608	2,697	32,156	29,125
Total gasoline production from crude	114,930	102,196	111,897	104,211	111,708	108,181	119,866	120,714	109,941	112,620	110,977	117,578	1,344,819	1,341,532
Gasoline produced from natural-gas liquids	16,464	14,195	15,019	14,472	15,345	15,648	15,834	16,093	14,727	16,695	17,573	17,409	189,474	178,881
Benzol blended	14	15	13	13	18	12	17	11	13	15	15	13	169	275
Total gasoline and naphtha production	131,408	116,406	126,929	118,696	127,071	123,841	135,717	136,818	124,681	129,330	128,565	135,000	1,534,462	1,520,688
Daily average	4,239	4,157	4,094	3,957	4,099	4,128	4,378	4,413	4,156	4,172	4,286	4,355	4,204	4,155
Imports	1,038	484	975	609	1,239	603	1,194	440	1,103	732	908	1,360	10,685	9,790
Exports	1,068	412	629	1,196	495	1,140	620	823	838	580	876	299	8,976	13,456
Daily average	34	15	20	40	16	38	20	27	28	19	29	10	25	37
Stocks, end of period:														
Finished gasoline	192,258	203,665	204,438	203,489	194,603	179,629	178,506	174,418	169,037	169,160	169,355	179,030	179,030	175,998
Naphtha	5,616	5,094	5,024	4,885	4,303	4,114	4,011	4,118	4,235	4,723	4,660	5,137	5,137	5,171
Total stocks	197,874	208,759	209,462	208,374	198,906	183,743	182,517	178,536	173,272	173,883	174,015	184,167	184,167	181,169
Domestic demand	114,673	105,593	126,572	119,197	137,283	138,467	137,517	140,416	130,210	128,871	128,465	125,909	1,533,173	1,511,670
Daily average	3,699	3,771	4,083	3,973	4,428	4,616	4,436	4,530	4,340	4,157	4,282	4,062	4,200	4,130
	1962 [2]													1961 total
Production:														
Finished gasoline from crude oil	113,370	102,183	111,283	106,015	113,041	114,756	120,165	116,725	113,202	111,885	109,880	117,904	1,350,409	1,312,663
Naphtha from crude oil	3,153	2,523	3,108	2,624	3,380	2,896	3,305	3,188	3,147	3,024	3,647	3,302	37,297	32,156
Total gasoline production from crude	116,523	104,706	114,391	108,639	116,421	117,652	123,470	119,913	116,349	114,909	113,527	121,206	1,387,706	1,344,819
Gasoline produced from natural-gas liquids	16,256	14,167	15,542	14,959	15,473	15,084	16,248	16,674	16,092	17,822	17,774	17,971	194,062	189,474
Benzol blended	9	5	4	10	6	4	3	4	10	12	13	11	91	169
Total gasoline and naphtha production	132,788	118,878	129,937	123,608	131,900	132,740	139,721	136,591	132,451	132,743	131,314	139,188	1,581,859	1,534,462
Daily average	4,283	4,246	4,192	4,120	4,255	4,424	4,507	4,406	4,415	4,282	4,377	4,490	4,334	4,204

Imports	444	865	829	992	1,029	1,438	987	1,355	1,561	1,501	1,284	1,685	13,970	10,685
Exports	381	404	147	645	329	644	643	773	777	804	399	508	6,454	8,976
Daily average	12	14	5	22	11	22	21	25	26	26	13	16	18	25
Stocks, end of period:														
Finished gasoline	189,789	199,878	199,704	194,698	186,759	180,107	177,348	167,638	174,733	171,336	170,351	184,512	184,512	179,030
Naphtha	5,803	5,867	6,259	5,727	5,607	5,427	5,719	5,384	5,163	5,072	5,064	5,626	5,626	5,137
Total stocks	195,592	205,745	205,963	200,425	192,366	185,534	183,067	173,022	179,896	176,408	175,415	190,138	190,138	184,167
Domestic demand	121,426	109,186	130,401	129,493	140,659	140,366	142,532	147,218	126,361	136,928	133,192	125,642	1,583,404	1,533,173
Daily average	3,917	3,899	4,206	4,317	4,537	4,679	4,598	4,749	4,212	4,417	4,440	4,053	4,338	4,200

[1] Excludes unfinished gasoline which is considered as unfinished oils.

[2] Preliminary figures.

TABLE 49.—Production of gasoline and naphtha at refineries in the United States in 1962,[1] by districts and months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Gasoline from crude oil:													
East Coast	16,401	14,429	15,945	14,158	15,007	14,712	16,186	16,519	15,473	14,738	13,950	16,167	183,685
Appalachian No. 1	1,251	1,168	1,292	1,133	1,047	1,378	1,395	1,234	1,387	1,219	1,103	1,307	14,914
Appalachian No. 2	1,575	1,406	1,460	1,343	1,559	1,635	1,574	1,677	1,670	1,381	1,179	1,503	17,962
Indiana, Illinois, Kentucky, etc	22,667	19,935	21,646	21,101	21,108	23,126	23,361	21,477	21,004	20,697	21,031	23,266	260,419
Minnesota, Wisconsin, etc	1,918	1,748	1,863	1,725	1,511	1,842	1,961	1,951	1,385	1,915	1,854	1,933	21,606
Oklahoma, Kansas, etc	11,158	10,185	10,475	9,690	11,650	11,071	12,000	11,498	11,293	10,876	11,535	11,490	132,921
Texas Inland	4,729	4,135	4,224	4,424	4,683	4,842	4,787	4,950	4,501	4,673	4,880	4,977	55,805
Texas Gulf Coast	23,024	22,157	24,448	24,640	26,044	25,489	25,845	25,087	23,795	25,091	22,847	23,962	292,429
Louisiana Gulf Coast	10,314	9,253	9,674	9,317	10,614	10,381	10,938	9,882	10,563	10,147	9,582	10,370	121,035
Arkansas, Louisiana Inland, etc	1,265	1,025	1,312	1,360	1,327	1,282	1,362	1,329	1,151	1,347	1,298	1,453	15,511
New Mexico	290	276	374	343	319	361	339	313	291	279	315	407	3,907
Rocky Mountain	4,233	3,729	3,664	3,076	3,852	4,017	4,282	4,344	4,412	4,151	4,154	4,358	48,272
West Coast	14,545	12,737	14,906	13,705	14,320	14,620	16,135	16,464	16,277	15,371	16,152	16,711	181,943
Total gasoline from crude oil	113,370	102,183	111,283	106,015	113,041	114,756	120,165	116,725	113,202	111,885	109,880	117,904	1,350,409
Natural-gas liquids blended at refineries:													
East Coast	283	233	146	214	135	93	130	139	155	178	274	512	2,492
Appalachian No. 1	18	9	8	---	1	1	---	---	2	8	16	15	78
Appalachian No. 2	---	---	9	14	12	14	17	16	14	14	13	17	140
Indiana, Illinois, Kentucky, etc	1,437	1,359	1,077	943	1,025	1,011	1,256	1,017	1,006	1,329	1,242	1,385	14,087
Minnesota, Wisconsin, etc	99	91	83	70	70	86	93	126	125	135	128	121	1,227
Oklahoma, Kansas, etc	1,777	1,268	1,407	1,448	1,456	1,321	1,475	1,612	1,645	1,693	1,834	1,854	18,790
Texas Inland	2,118	1,896	2,000	2,006	2,134	1,991	2,280	2,231	2,353	2,157	2,035	1,862	25,063
Texas Gulf Coast	4,830	4,453	4,958	4,270	5,335	5,395	5,257	5,612	5,612	6,156	5,787	5,778	63,443
Louisiana Gulf Coast	1,667	1,364	1,552	1,555	1,425	1,511	1,566	1,649	1,894	1,918	1,996	1,963	20,060
Arkansas, Louisiana Inland, etc	699	634	717	687	702	660	637	638	609	672	701	697	8,053
New Mexico	95	86	84	117	129	146	142	160	144	131	144	131	1,509
Rocky Mountain	276	270	304	260	293	295	325	412	323	382	366	414	3,920
West Coast	1,989	1,830	2,064	2,032	2,026	1,958	2,130	1,991	1,834	2,028	1,938	2,074	23,894
Total natural-gas liquids blended	15,288	13,493	14,409	13,616	14,743	14,482	15,308	15,603	15,716	16,801	16,474	16,823	[2] 182,756
Benzol blended	9	5	4	10	6	4	3	4	10	12	13	11	91
Total gasoline produced at refineries	128,667	115,681	125,696	119,641	127,790	129,242	135,476	132,332	128,928	128,698	126,367	134,738	1,533,256

Naphtha from crude oil:													
East Coast	75	122	193	119	149	181	96	176	155	102	158	165	1,691
Appalachian No. 1	29	15	30	36	11	29	27	15	29	32	22	38	313
Appalachian No. 2	19	4	5	3	----------	15	17	17	14	5	20	4	123
Indiana, Illinois, Kentucky, etc	416	300	411	317	578	296	493	395	260	267	294	309	4,336
Minnesota, Wisconsin, etc	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Oklahoma, Kansas, etc	226	186	156	205	189	158	230	193	211	160	209	222	2,345
Texas Inland	57	51	52	19	7	17	34	34	116	47	62	32	528
Texas Gulf Coast	1,673	1,595	1,925	1,718	2,003	1,774	2,173	2,108	2,105	2,094	2,550	2,091	23,809
Louisiana Gulf Coast	63	59	89	32	40	51	28	21	42	31	32	29	517
Arkansas, Louisiana Inland, etc	71	87	93	93	85	77	65	69	61	76	68	82	927
New Mexico	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Rocky Mountain	13	10	26	6	33	2	15	16	16	12	38	10	197
West Coast	511	94	128	76	285	296	127	144	138	198	194	320	2,511
Total naphtha from crude oil	3,153	2,523	3,108	2,624	3,380	2,896	3,305	3,188	3,147	3,024	3,647	3,302	37,297
Total gasoline and naphtha produced at refineries	131,820	118,204	128,804	122,265	131,170	132,138	138,781	135,520	132,075	131,722	130,014	138,040	1,570,553

---

[1] Preliminary figures.
[2] Excludes gasoline blended at terminal facilities.

There are definite normal seasonal variations in gasoline storage because of a summer peak and winter low in gasoline demand. These stocks build up in the winter, although refinery yields are lower, and decrease sharply during the summer. This variation in stocks makes unnecessary large variations in the seasonal yields of gasoline from crude oil. Demand for the heating oils, the exact reverse, is high in winter and low in summer.

Stocks of gasoline at the beginning of the year were 3 million barrels above the level of a year ago. High demand kept the normal stock build up at a more moderate rate, and closing stocks for the first five months of 1962 were well below the comparable months of 1961. The increase in gasoline demand for June was much lower than expected and exceptionally high crude runs reversed the favorable stock position of the earlier months. Stocks throughout most of the remaining months of the year were considered by many industry spokesmen as being too high. Closing stocks of gasoline for the year were 190.1 million barrels, compared with 184.2 million at the end of 1961.

Prices.—The dealer's average net price for regular-grade gasoline (exclusive of dealer's margin and sales tax) in 55 representative cities in the United States provides an index of wholesale gasoline prices. The average service station price (excluding taxes) decreased from 20.53 cents per gallon in 1961 to 20.36 cents in 1962. The average tax on gasoline in 1962 was 10.28 cents per gallon. Federal tax was 4.00 cents per gallon; state taxes averaged 6.23 cents per gallon; and local taxes were 0.05 cent per gallon.

TABLE 50.—Consumption, production, and distribution[1] of gasoline in 1962, by PAD districts

(Millions of barrels)

	PAD Districts					
	I	II	III	IV	V	Total
Consumption[2]	540.8	548.5	210.6	47.8	227.2	1,574.9
Supply:						
Production[3]	201.2	467.2	606.8	52.2	205.8	1,533.2
Imports	12.8	.1	---------	---------	1.1	14.0
Received from other districts:						
From District I	---------	18.2	.3	---------	---------	---------
From District II	7.2	---------	13.0	.1	---------	---------
From District III	341.0	89.9	---------	5.8	10.8	---------
From District IV	3.2	---------	---------	---------	11.2	---------
From District V	---------	---------	---------	1.9	---------	---------
Total receipts	351.4	108.1	13.3	7.8	22.0	---------
Total supply	565.4	575.4	620.1	60.0	228.9	1,547.2
Stock change[4]	−1.9	−2.1	+8.0	−.2	+1.7	+5.5
Shipped to other districts	18.5	20.3	447.5	14.4	1.9	---------
Exports	.4	.5	4.5	.1	1.0	6.5
Domestic demand	548.4	556.7	160.1	45.7	224.3	1,535.2
Difference between consumption and demand	−7.6	−8.2	+50.5	+2.1	+2.9	+39.7

[1] Apparent distribution of gasoline by districts is based on actual data on tidewater and river shipments compiled by the Geological Survey, U.S. Department of the Interior. An estimate of annual interdistrict railroad shipments was computed from 1961 data compiled by the Bureau of Transport Economics, Interstate Commerce Commission and records compiled by the San Francisco office of the Bureau of Mines. Interdistrict pipeline shipments are compiled by the Bureau of Mines. Information on shipments moving from PAD District II by way of the Great Lakes ports and the Ohio River to PAD District I were compiled from data supplied by the Corps of U.S. Army Engineers.

[2] Compiled by the American Petroleum Institute.

[3] Excludes naphtha production and gasoline blended at terminal facilities.

[4] Excludes naphtha.

TABLE 51.—Production (refinery output) and consumption of gasoline (excluding naphtha) in the United States, by States

(Thousand barrels)

	1960		1961		1962 [1]	
	Production	Consumption [2]	Production	Consumption [2]	Production	Consumption [2]
Alabama	(3)	24,273	(3)	24,810	(3)	25,913
Alaska	---	1,907	---	1,832	---	1,697
Arizona	---	12,500	---	12,828	---	13,626
Arkansas	12,411	14,470	12,512	15,107	12,168	16,038
California	[4] 192,225	143,253	[4] 200,655	149,385	[4] 205,837	154,958
Colorado	6,139	17,204	6,692	17,664	6,991	18,191
Connecticut	---	18,808	---	19,397	---	20,364
Delaware	(5)	4,844	(5)	5,075	(5)	5,292
District of Columbia	---	4,830	---	4,885	---	5,174
Florida	---	45,488	---	46,070	---	48,084
Georgia	(6)	31,731	(6)	32,223	(6)	34,250
Hawaii	(4)	5,244	(4)	5,741	(4)	4,581
Idaho	---	6,760	---	7,018	---	7,131
Illinois	111,807	73,591	110,455	73,835	107,708	76,853
Indiana	70,253	43,529	72,392	43,374	72,219	44,403
Iowa	---	28,837	---	28,863	---	28,936
Kansas	60,639	25,800	62,166	26,231	63,825	26,851
Kentucky	[7] 16,159	21,874	[7] 14,847	22,237	[7] 15,209	23,377
Louisiana	[3] 139,415	22,940	[3] 143,895	23,296	[3] 152,491	24,342
Maine	---	8,198	---	8,321	---	8,379
Maryland	(6)	22,255	(6)	22,861	(6)	23,959
Massachusetts	[5] 25,803	34,790	[5] 27,645	35,523	[5] 27,154	36,403
Michigan	20,988	65,735	20,513	65,620	21,431	68,093
Minnesota	10,677	32,916	11,468	32,702	11,945	33,344
Mississippi	(3)	15,912	(3)	16,185	(3)	16,989
Missouri	[8] 12,282	41,864	[8] 11,747	41,775	[9] 13,594	42,959
Montana	10,494	7,513	10,328	7,930	11,943	8,753
Nebraska	(8)	14,969	(8)	15,004	(8)	15,523
Nevada	---	3,793	---	4,078	---	4,655
New Hampshire	---	4,986	---	4,977	---	5,117
New Jersey	66,323	48,814	66,195	49,159	62,044	50,228
New Mexico	4,557	9,637	4,746	9,728	5,416	10,098
New York	11,930	102,848	12,732	106,724	11,909	112,743
North Carolina	---	35,387	---	37,628	---	38,157
North Dakota	[9] 10,373	7,942	[9] 9,800	7,561	[9] 10,888	7,786
Ohio	74,009	77,702	75,957	77,602	76,054	80,705
Oklahoma	71,147	27,025	71,466	26,848	74,292	27,848
Oregon	---	16,380	---	17,072	---	17,501
Pennsylvania	89,418	78,589	85,905	77,653	92,993	79,610
Rhode Island	(5)	5,931	(5)	6,017	(5)	6,079
South Carolina	(6)	17,674	(6)	18,018	(6)	18,744
South Dakota	---	8,474	---	8,581	---	8,943
Tennessee	(7)	29,075	(7)	29,871	(7)	29,411
Texas	421,387	107,938	410,463	112,366	436,740	117,287
Utah	15,550	8,520	15,537	9,144	16,332	9,152
Vermont	---	3,236	---	3,273	---	3,347
Virginia	[6] 7,146	31,776	[6] 6,539	31,893	[6] 6,418	33,070
Washington	(4)	28,472	(4)	28,879	(4)	30,153
West Virginia	812	12,192	705	12,431	716	11,790
Wisconsin	(9)	32,690	(9)	32,753	(9)	33,430
Wyoming	17,256	4,405	16,750	4,380	16,939	4,544
Total	1,479,200	1,495,521	1,482,110	1,522,428	1,533,256	1,574,861

[1] Preliminary figures.
[2] American Petroleum Institute.
[3] Alabama and Mississippi included with Louisiana.
[4] Washington and Hawaii included with California.
[5] Delaware and Rhode Island included with Massachusetts.
[6] Maryland, South Carolina, and Georgia (1961-62) included with Virginia.
[7] Tennessee included with Kentucky.
[8] Nebraska included w;th Missouri.
[9] Wisconsin included with North Dakota.

TABLE 52.—Stocks of gasoline and naphtha in the United States in 1962, by districts and months

(Thousand barrels)

	Jan. 31	Feb. 28	Mar. 31	Apr. 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
Gasoline: [1]												
East Coast	44, 297	44, 368	45, 115	45, 778	46, 076	45, 081	44, 475	41, 814	44, 743	44, 186	40, 517	40, 953
Appalachian No. 1	5, 808	5, 922	5, 735	5, 691	5, 089	5, 134	5, 530	5, 095	5, 147	4, 823	5, 057	5, 068
Appalachian No. 2	2, 916	3, 173	3, 076	3, 156	2, 803	2, 954	3, 030	3, 142	3, 090	2, 894	2, 984	3, 236
Indiana, Illinois, Kentucky, etc	35, 127	37, 062	38, 566	36, 393	33, 067	31, 532	31, 784	28, 511	30, 226	28, 874	27, 840	31, 311
Minnesota, Wisconsin, North Dakota and South Dakota	7, 135	7, 423	7, 350	7, 314	7, 670	7, 419	7, 013	6, 361	6, 093	6, 330	6, 357	6, 688
Oklahoma, Kansas, etc	18, 807	20, 347	19, 130	18, 074	17, 453	15, 595	15, 540	14, 970	15, 155	14, 470	15, 023	15, 910
Texas Inland	7, 273	7, 136	6, 699	6, 660	6, 406	6, 242	6, 380	6, 027	6, 500	6, 301	6, 687	7, 451
Texas Gulf Coast	20, 550	24, 034	23, 542	23, 073	21, 368	22, 192	20, 269	21, 240	19, 625	20, 342	21, 650	24, 349
Louisiana Gulf Coast	10, 797	12, 180	11, 413	10, 698	10, 712	10, 277	10, 244	9, 440	10, 782	10, 287	9, 766	11, 158
Arkansas, Louisiana Inland, etc	6, 399	6, 850	6, 708	6, 596	6, 211	5, 720	6, 334	5, 459	6, 211	6, 337	6, 017	7, 043
New Mexico	615	663	639	799	841	710	701	724	803	723	674	797
Rocky Mountain	6, 607	7, 393	7, 458	6, 586	6, 431	5, 690	4, 798	3, 903	4, 178	4, 128	4, 649	5, 676
West Coast	23, 458	23, 327	24, 273	23, 880	22, 632	21, 561	21, 250	20, 952	22, 180	21, 641	23, 130	24, 872
Total gasoline	189, 789	199, 878	199, 704	194, 698	186, 759	180, 107	177, 348	167, 638	174, 733	171, 336	170, 351	184, 512
Naphtha:												
East Coast	515	537	583	560	543	580	489	500	546	479	546	549
Appalachian No. 1	108	102	113	125	108	65	59	57	66	59	62	59
Appalachian No. 2	51	43	45	29	35	14	16	18	20	13	21	16
Indiana, Illinois, Kentucky, etc	778	671	685	578	744	526	654	498	476	436	443	470
Minnesota, Wisconsin, North Dakota and South Dakota	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Oklahoma, Kansas, etc	361	350	336	293	238	192	240	193	237	205	238	295
Texas Inland	73	92	99	51	36	24	30	32	45	32	41	42
Texas Gulf Coast	2, 326	2, 387	2, 545	2, 428	2, 620	2, 452	2, 581	2, 598	2, 500	2, 378	2, 352	2, 505
Louisiana Gulf Coast	120	115	146	148	118	126	92	75	86	88	93	83
Arkansas, Louisiana Inland, etc	128	132	128	141	74	75	63	57	58	62	55	80
New Mexico	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Rocky Mountain	44	45	58	38	51	37	32	31	27	20	42	36
West Coast	1, 299	1, 393	1, 521	1, 336	1, 040	1, 336	1, 463	1, 325	1, 102	1, 300	1, 171	1, 491
Total naphtha	5, 803	5, 867	6, 259	5, 727	5, 607	5, 427	5, 719	5, 384	5, 163	5, 072	5, 064	5, 626

Total gasoline and naphtha:												
East Coast	44,812	44,905	45,698	46,338	46,619	45,661	44,964	42,314	45,289	44,665	41,063	41,502
Appalachian No. 1	5,916	6,024	5,848	5,816	5,197	5,199	5,589	5,152	5,213	4,882	5,119	5,127
Appalachian No. 2	2,967	3,216	3,121	3,185	2,838	2,968	3,046	3,160	3,110	2,907	3,005	3,252
Indiana, Illinois, Kentucky, etc	35,905	37,733	39,251	36,971	33,811	32,058	32,438	29,009	30,702	29,310	28,283	31,781
Minnesota, Wisconsin, North Dakota and South Dakota	7,135	7,423	7,350	7,314	7,670	7,419	7,013	6,361	6,093	6,330	6,357	6,688
Oklahoma, Kansas, etc	19,168	20,697	19,466	18,367	17,691	15,787	15,780	15,163	15,392	14,675	15,261	16,205
Texas Inland	7,346	7,228	6,798	6,711	6,442	6,266	6,410	6,059	6,545	6,333	6,728	7,493
Texas Gulf Coast	22,876	26,421	26,087	25,501	23,988	24,644	22,850	23,838	22,125	22,720	24,002	26,854
Louisiana Gulf Coast	10,917	12,295	11,559	10,846	10,830	10,403	10,336	9,515	10,868	10,375	9,859	11,241
Arkansas, Louisiana Inland, etc	6,527	6,982	6,836	6,737	6,285	5,795	6,397	5,516	6,269	6,399	6,072	7,123
New Mexico	615	663	639	799	841	710	701	724	803	723	674	797
Rocky Mountain	6,651	7,438	7,516	6,624	6,482	5,727	4,830	3,934	4,205	4,148	4,691	5,712
West Coast	24,757	24,720	25,794	25,216	23,672	22,897	22,713	22,277	23,282	22,941	24,301	26,363
Total: 1962	195,592	205,745	205,963	200,425	192,366	185,534	183,067	173,022	179,896	176,408	175,415	190,138
1961	197,874	208,759	209,462	208,374	198,906	183,743	182,517	178,536	173,272	173,883	174,015	184,167

---

[1] Includes stocks of gasoline at refineries, bulk terminals and in pipelines.

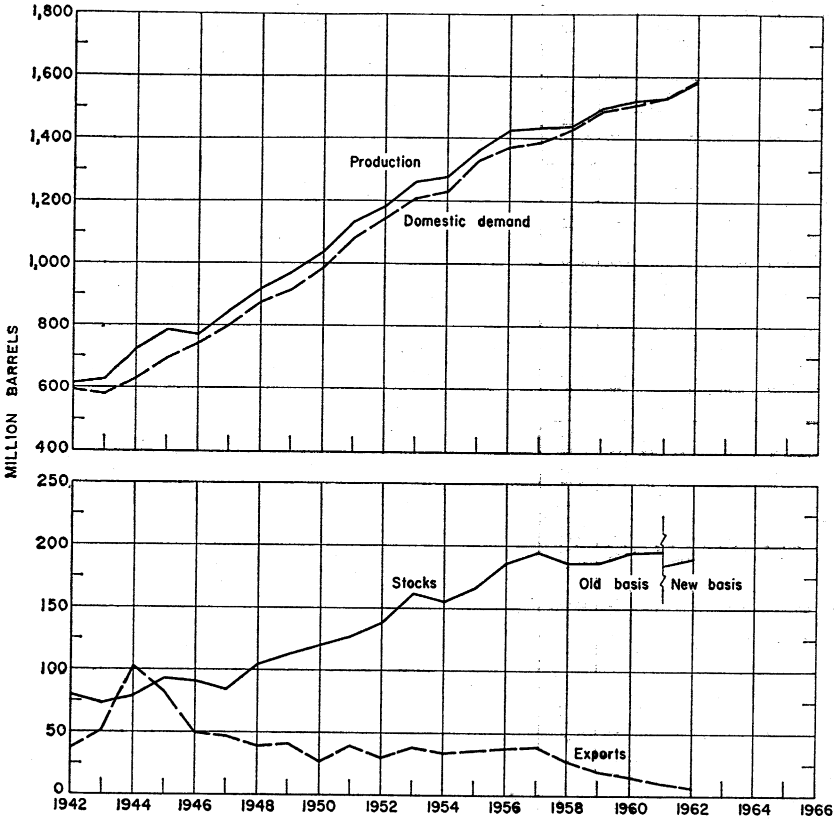


FIGURE 8.—Production, domestic demand, exports, and stocks of gasoline in the United States, 1942–62.

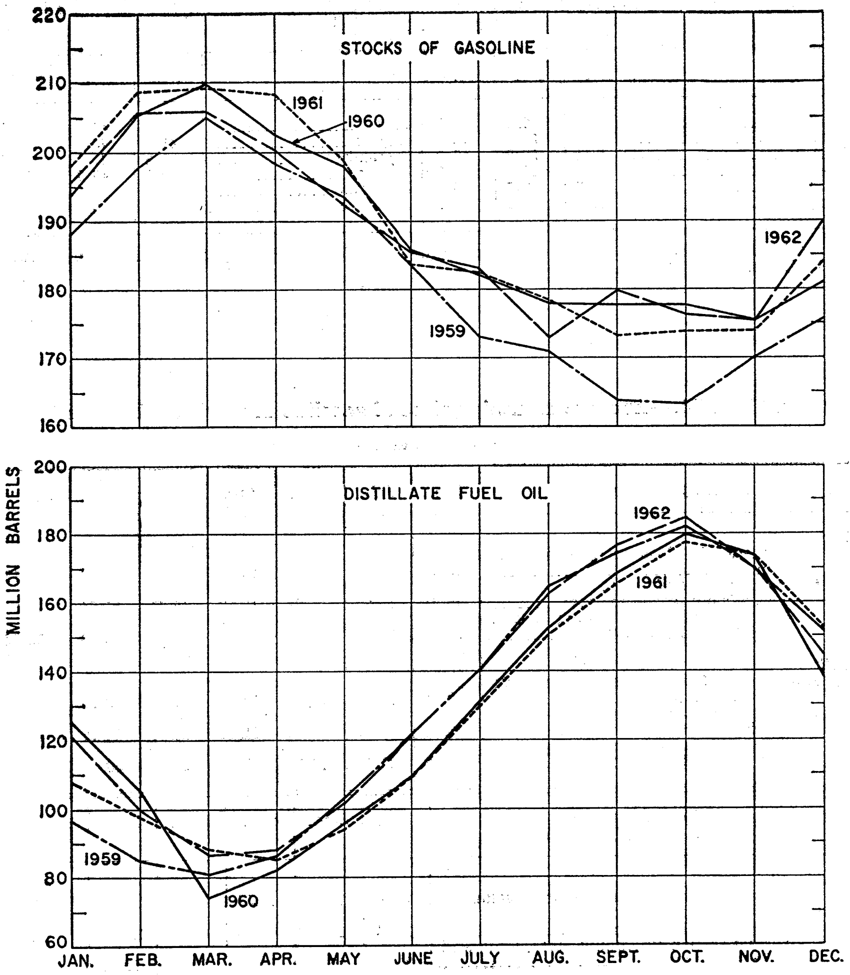


FIGURE 9.—Stocks of gasoline and distillate fuel oil in the United States, 1959–62, by months.

TABLE 53.—Day's supply of gasoline and naphtha on hand in the United States at end of month [1]

	1960	1961	1962 [2]		1960	1961	1962 [2]
January	51.1	52.3	50.0	July	40.7	40.1	38.3
February	52.6	50.9	48.9	August	41.4	40.9	40.8
March	48.4	52.2	47.5	September	43.3	41.5	40.5
April	48.0	46.9	44.1	October	42.5	40.3	39.6
May	42.7	42.7	40.9	November	43.3	42.7	43.1
June	42.3	41.2	40.2	December	48.6	46.9	47.3

[1] Stocks divided by daily average total demand (domestic demand plus exports) for succeeding month.
[2] Preliminary figures.

TABLE 54.—Average monthly prices of gasoline in the United States

(Cents per gallon)

Monthly average	Jan.	Feb.	Mar.	Apr.	May	June	July
1961:							
At refineries in Oklahoma, regular, 91 octane	13.38	13.38	13.38	13.38	12.99	13.13	13.13
Of 55 cities on 1st of month:							
Dealer's net (excluding tax)	16.51	16.22	16.22	15.59	15.51	15.84	15.98
Service station (including State, local, and Federal taxes)	31.60	31.26	31.25	30.33	30.42	30.50	30.82
1962:							
At refineries in Oklahoma, regular, 91 octane	12.34	11.26	10.84	12.64	12.91	13.00	13.00
Of 55 cities on 1st of month:							
Dealer's net (excluding tax)	15.74	15.66	15.06	14.94	14.73	15.21	14.88
Service station (including State, local, and Federal taxes)	30.69	30.71	30.15	30.12	29.77	30.12	30.06

Monthly average	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1961:						
At refineries in Oklahoma, regular, 91 octane	12.92	11.88	11.88	12.00	12.22	12.80
Of 55 cities on 1st of month:						
Dealer's net (excluding tax)	16.41	15.83	15.05	15.40	15.00	15.80
Service station (including State, local, and Federal taxes)	31.60	30.85	30.12	30.37	30.03	30.76
1962:						
At refineries in Oklahoma, regular, 91 octane	13.00	13.00	13.00	13.00	12.77	12.56
Of 55 cities on 1st of month:						
Dealer's net (excluding tax)	15.15	16.35	15.96	15.67	16.10	15.45
Service station (including State, local, and Federal taxes)	30.49	31.88	31.21	31.01	31.43	30.64

Source: Platt's Oil Price Handbook and Platt's Oilgram Price Service.

TABLE 55.—Transportation of petroleum products by pipeline, by months

(Thousand barrels)

Item	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
Turned into lines: [1]													
Gasoline	58,847	50,149	56,120	59,975	63,645	63,510	64,761	63,599	60,964	61,673	59,960	67,741	730,944
Kerosine	8,072	6,094	4,739	4,070	3,926	4,160	4,106	4,649	5,473	5,849	6.220	8.441	65.799
Distillate fuel oil	28,695	24,963	16,981	14,396	15,452	17,245	16,686	17,776	17,474	19,065	21,623	27,133	237,489
Military jet fuel	2,261	2,247	2,799	2,502	2,752	2,609	2,972	2,882	2,174	2,415	2,553	2,186	30,352
Natural-gas liquids	7,198	5,943	5,793	5,820	6,395	6,307	6,024	6,938	6,330	7,298	8,618	9,669	82,333
Delivered from lines: [1]													
Gasoline	56,625	49,777	55,044	59,228	64,229	64,344	64,569	65,219	61,288	62,127	60,552	60,396	723,398
Kerosine	7,782	6,477	4,921	3,835	4,300	3,688	3,959	4,290	5,486	5,852	5,891	8,314	64,795
Distillate fuel oil	31,686	26,281	18,438	15,445	14,201	15,698	15,860	15,621	16,185	18,577	20,986	29,448	238,426
Military jet fuel	2,265	2,214	2,736	2,418	2,915	2,426	2,962	2,798	2,369	2,311	2,465	2,165	30,044
Natural-gas liquids	7,251	6.095	5,911	5,756	6,147	5,739	5,615	6,488	6,089	7,171	8,176	9,234	79,672
Shortage (overage): [2]													
Gasoline	(47)	(8)	10	41	96	(1)	69	(54)	15	74	91	(60)	226
Kerosine	141	126	114	75	88	76	62	89	82	(22)	72	70	973
Distillate fuel oil	23	(54)	(47)	(6)	(7)	(6)	(33)	52	(81)	158	(15)	31	15
Military jet fuel	5	3	8	6	(37)	48	7	----------	9	4	8	1	62
Natural-gas liquids	60	(14)	54	32	14	6	3	47	41	36	91	33	403
Stocks in lines and working tanks at end of month:													
Gasoline	25,522	25,902	26,968	27,674	26,994	26,161	26,284	24,718	24,379	23,851	23,168	24,573	24,573
Kerosine	2,964	2,455	2,159	2,319	1,857	2,253	2,338	2,608	2,513	2,532	2,789	2,846	2,846
Distillate fuel oil	13,551	12,287	10,877	9,834	11,092	12,645	13,504	15,607	16,977	17,307	17,959	15,613	15,613
Military jet fuel	405	435	490	568	442	577	580	664	460	560	640	660	660
Natural-gas liquids	3,534	3,396	3,224	3,256	3,490	4,052	4,458	2,809	3,009	3,100	3,451	3,853	3,853
1962:													
Turned into lines: [1]													
Gasoline	58,571	56,120	63,008	63,732	67,913	68,308	69,195	68,057	64,398	66,428	65,014	64,552	775,296
Kerosine	8,237	7,219	6,619	5,267	4,669	4,686	5,036	6,318	5,631	6,788	6,671	8,107	75,248
Distillate fuel oil	31,204	25.931	22,655	17,035	16.758	16,973	18,299	19,890	18,926	20,726	25,595	30,452	264,444
Military jet fuel	2,345	2,057	2,348	2,203	3,140	2,481	2,523	2,859	2,127	2,437	1,853	2,308	28,681
Natural-gas liquids	10,016	7,413	8,464	6,789	6,711	7,263	7,963	7,903	7,686	8,486	9,819	12,294	100,807
Delivered from lines: [1]													
Gasoline	59,093	54,061	62,282	62,451	68,426	68,830	69.290	69,773	63,490	67,327	65,751	63,446	774,220
Kerosine	7,853	7,753	6,802	5,487	4,922	4,367	4,917	5,515	5,596	6,437	6,675	8,064	74,388
Distillate fuel oil	33,222	28,141	24,559	17,158	15,260	15,373	16,631	17,744	17,998	20,215	25,300	32,984	264,585

See footnotes at end of table.

TABLE 55.—Transportation of petroleum products by pipeline, by months—Continued

(Thousand barrels)

Item	January	February	March	April	May	June	July	August	September	October	November	December	Total
1962—Continued													
Delivered from lines—Continued													
Military jet fuel	2, 431	1, 996	2, 489	2, 121	3, 052	2, 704	2, 433	2, 664	2, 399	2, 210	1, 945	2, 056	28, 500
Natural-gas liquids	9, 697	8, 010	8, 193	7, 148	6, 721	7, 253	7, 476	8, 133	7, 280	8, 508	9, 439	11, 691	99, 549
Shortage (overage): [2]													
Gasoline	38	7	(26)	57	(40)	64	76	16	74	24	(62)	11	239
Kerosine	127	69	105	59	85	89	57	112	83	101	99	124	1, 110
Distillate fuel oil	32	(15)	(13)	(25)	(14)	(60)	36	(25)	(6)	(23)	(176)	135	(154)
Military jet fuel	4	(3)	11	1	11	6	----------	3	7	7	(3)	19	63
Natural-gas liquids	67	24	20	15	26	37	38	22	23	139	37	103	551
Stocks in lines and working tanks at end of month:													
Gasoline	24, 013	26, 065	26, 817	28, 041	27, 568	26, 982	26, 811	25, 079	25, 913	24, 990	24, 315	25, 410	25, 410
Kerosine	3, 103	2, 500	2, 212	1, 933	1, 595	1, 825	1, 887	2, 578	2, 530	2, 780	2, 677	2, 596	2, 596
Distillate fuel oil	13, 563	11, 368	9, 477	9, 379	10, 891	12, 551	14, 183	16, 354	17, 288	17, 822	18, 293	15, 626	15, 626
Military jet fuel	570	634	482	563	640	411	501	693	414	634	545	778	778
Natural-gas liquids	4, 105	3, 484	3, 735	3, 361	3, 325	3, 298	3, 747	3, 495	3, 878	3, 717	4, 060	4, 560	4, 560

---

[1] The quantities "Turned into lines" and "Delivered from lines" are on a net basis, eliminating intersystem transfers.

[2] Figures in parentheses represent overage.

TABLE 56.—Transportation of petroleum products by pipeline between PAD districts in the United States by months

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1961:													
From District 1 to District 2:													
Gasoline	1,247	1,227	1,268	1,517	1,457	1,530	1,445	1,614	1,619	1,616	1,501	1,668	17,709
Kerosine	141	119	115	22	30	17	57	37	73	111	88	139	949
Distillate fuel oil	250	168	256	216	206	212	287	281	228	259	250	299	2,912
Military jet fuel	--------	--------	15	--------	15	50	--------	--------	--------	--------	--------	--------	80
From District 2 to District 1:													
Gasoline	386	349	504	407	471	453	768	477	440	518	467	448	5,688
From District 2 to District 3:													
Gasoline	915	627	905	1,339	1,276	1,222	1,026	1,028	1,269	1,286	1,199	1,138	13,230
Distillate fuel oil	647	648	324	199	305	227	373	643	369	469	333	558	5,095
Military jet fuel	154	140	224	121	187	197	156	142	85	--------	104	125	1,635
From District 3 to District 1:													
Gasoline	4,941	3,976	5,419	7,333	7,234	7,382	7,737	7,645	7,063	7,690	7,571	7,076	81,067
Kerosine	1,495	1,509	1,070	262	322	289	681	832	1,358	1,064	1,044	1,318	11,244
Distillate fuel oil	1,839	1,693	1,826	996	1,079	1,667	1,774	1,494	1,673	1,768	1,766	2,151	19,726
Military jet fuel	110	75	100	130	329	200	210	225	231	119	178	158	2,065
From District 3 to District 2:													
Gasoline	2,661	2,696	3,271	3,183	4,295	4,114	3,902	3,362	3,727	3,401	3,436	3,592	41,640
Kerosine	219	218	178	45	204	137	70	66	35	49	216	333	1,770
Distillate fuel oil	1,050	665	513	631	718	909	593	831	710	911	760	1,008	9,299
Military jet fuel	--------	--------	31	52	66	54	52	41	9	39	--------	--------	344
Natural-gas liquids	2,598	2,009	1,065	1,116	928	1,211	1,019	1,697	1,757	1,901	3,019	3,720	22,040
From District 3 to District 4:													
Gasoline	440	407	447	448	458	543	576	562	523	515	489	474	5,882
Kerosine	130	100	92	105	98	114	118	116	127	137	129	150	1,416
Distillate fuel oil	71	70	59	63	68	66	75	65	78	79	62	83	839
Military jet fuel	34	41	50	34	34	17	--------	33	25	26	34	47	375
Natural-gas liquids	106	75	45	31	15	11	16	54	46	37	87	128	651
From District 3 to District 5:													
Gasoline	618	487	582	510	550	526	586	559	530	455	571	581	6,555
Kerosine	6	24	26	36	23	23	12	17	18	18	35	28	266
Distillate fuel oil	147	119	113	140	109	136	122	136	112	157	139	146	1,576
Military jet fuel	207	211	228	166	209	165	271	188	--------	261	190	205	2,301
From District 4 to District 2:													
Gasoline	122	104	122	252	271	231	301	293	201	173	189	181	2,440
Kerosine	3	3	6	7	7	--------	--------	2	--------	3	2	4	37
Distillate fuel oil	42	45	50	108	115	67	54	75	68	131	95	90	940
From District 4 to District 5:													
Gasoline	400	425	425	519	546	549	465	535	564	476	407	451	5,762
Distillate fuel oil	475	362	281	205	201	230	258	180	249	364	303	410	3,518
Military jet fuel	137	167	85	35	75	52	107	135	195	212	137	72	1,409

TABLE 56.—Transportation of petroleum products by pipeline between PAD districts in the United States by months—Continued

(Thousand barrels)

	January	February	March	April	May	June	July	August	September	October	November	December	Total
1962:													
From District 1 to District 2:													
Gasoline	1,440	1,255	1,584	1,239	1,567	1,469	1,641	1,601	1,400	1,593	1,625	1,488	17,902
Kerosine	138	127	50	48	61	42	22	41	84	81	140	135	969
Distillate fuel oil	312	397	223	252	234	221	320	325	313	215	335	301	3,448
From District 2 to District 1:													
Gasoline	453	459	497	430	432	324	400	467	425	253	243	416	4,799
From District 2 to District 3:													
Gasoline	1,018	818	1,176	1,091	923	1,003	910	1,124	1,105	987	1,162	1,203	12,520
Distillate fuel oil	488	118	240	330	273	243	237	453	491	481	419	533	4,306
Military jet fuel	355	195	173	98	----------	50	100	50	50	100	75	30	1,276
From District 3 to District 1:													
Gasoline	6,987	5,765	7,522	7,745	7,894	7,827	8,262	7,784	7,484	8,225	7,468	7,284	90,247
Kerosine	1,509	1,577	880	703	704	615	745	786	1,080	1,200	1,192	1,480	12,471
Distillate fuel oil	2,194	2,068	1,873	1,320	1,586	1,778	1,731	1,818	1,752	1,534	1,912	2,145	21,711
Military jet fuel	110	130	184	202	276	287	269	252	142	89	153	167	2,261
Natural-gas liquids	----------	13	81	78	80	147	328	247	174	215	319	567	2,249
From District 3 to District 2:													
Gasoline	3,312	2,876	3,625	3,365	4,097	3,678	3,548	3,883	4,028	4,111	4,078	3,412	44,013
Kerosine	293	272	162	97	98	68	170	166	157	356	191	448	2,478
Distillate fuel oil	1,308	1,101	697	626	678	581	1,000	941	1,401	1,471	886	954	11,644
Military jet fuel	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	42	16	58
Natural-gas liquids	3,544	2,804	1,982	1,485	1,538	1,738	1,506	1,982	2,199	2,547	3,289	5,770	30,384
From District 3 to District 4:													
Gasoline	463	426	469	476	513	540	523	559	493	545	506	258	5,771
Kerosine	106	20	23	141	167	153	148	146	138	157	147	141	1,487
Distillate fuel oil	94	76	87	95	59	79	76	80	75	74	78	34	907
Military jet fuel	44	32	33	----------	----------	----------	----------	----------	17	18	18	----------	162
Natural-gas liquids	139	64	89	43	27	24	24	31	47	24	44	88	644
From District 3 to District 5:													
Gasoline	696	579	623	638	647	644	618	569	512	637	597	610	7,370
Kerosine	40	53	41	20	32	27	18	15	20	30	28	33	357
Distillate fuel oil	89	161	145	97	105	127	143	150	137	126	130	150	1,569
Military jet fuel	159	180	220	114	287	230	239	301	120	259	197	177	2,483
From District 4 to District 2:													
Gasoline	158	137	215	234	211	263	272	303	267	217	204	203	2,684
Kerosine	2	2	5	3	3	2	2	4	3	4	4	4	38
Distillate fuel oil	145	86	141	100	88	74	89	99	104	117	81	101	1,225
From District 4 to District 5:													
Gasoline	513	432	484	554	546	662	616	577	633	614	489	583	6,703
Distillate fuel oil	341	347	375	292	245	223	266	297	204	445	406	475	3,916
Military jet fuel	136	141	129	61	201	242	236	262	332	230	196	203	2,369

KEROSINE

The total demand for kerosine was 164.3 million barrels, an increase of 13.6 percent for 1962. Domestic demand totaled 164.0 million barrels, and export totaled 0.3 million. Sales of kerosine for use as commercial jet fuel were 65.7 million barrels, an increase of 39.2 percent for the year. Imports of kerosine were 6.3 million barrels in 1962 compared with 3.0 million in 1961. The use of kerosine, imported in bond (duty-free), as jet fuel for aircraft engaged in overseas flights increased from 3.0 million barrels in 1961 to 5.7 million barrels in 1962.

Kerosine deliveries by pipeline in 1962 were 74.4 million barrels, 9.6 million barrels more than in 1961. Coastwise shipments increased 4.3 million barrels to 49.0 million barrels, and interdistrict barge shipments on the Mississippi River in 1962 increased 1.1 million barrels.

Tanker rates for kerosine from the gulf coast to U.S. destinations north of Cape Hatteras in 1962 averaged 37.0 cents per barrel, 4.2 cents below the 1961 average.

The average posted prices of kerosine at Oklahoma refineries in 1962 was 11.01 cents per gallon, an increase of 0.30 cent for the year. The average posted price on barges in New York Harbor declined 0.26 cent for the year to 11.13 cents per gallon while the tank-wagon price in New York City dropped only 0.12 cent per gallon. The tank-wagon prices in Chicago increased 0.7 cent per gallon.

TABLE 57.—Salient statistics of kerosine in the United States, 1961–62, by months and refinery districts

(Thousand barrels)

Month and district	Production from crude	Yield (percent)	Production from natural-gas liquids	Imports	Exports	Stocks (end of period)	Domestic demand
	1961						
Month:							
January	13,857	5.3	155	80	42	27,365	18,130
February	12,040	5.0	143	118	20	24,471	15,175
March	12,679	5.1	98	186	28	25,666	11,740
April	10,555	4.6	73	174	19	27,348	9,101
May	9,921	4.0	77	321	20	28,384	9,263
June	9,466	4.0	57	292	15	30,305	7,879
July	11,125	4.3	76	298	3	32,440	9,361
August	11,325	4.3	114	309	26	33,929	10,233
September	11,259	4.6	95	338	11	35,911	9,699
October	13,134	5.1	118	281	16	37,257	12,171
November	12,450	5.0	119	269	15	36,224	13,856
December	13,599	5.1	155	298	16	32,433	17,827
Total	141,410	4.7	1,280	2,964	231	32,433	144,435
District:							
East Coast	12,911	2.9	----------	2,793	97	12,936	(3)
Appalachian No. 1	1,396	3.8	----------			785	
Appalachian No. 2	1,992	5.5	----------	---------	8	405	
Indiana, Illinois, Kentucky, etc	27,256	5.0	----------			6,133	
Minnesota, Wisconsin, North Dakota, etc	2,019	4.5	----------			1,456	
Oklahoma, Kansas, etc	5,937	2.3	----------			1,504	
Texas Inland	4,034	3.6	436	---------	78	745	
Texas Gulf Coast	43,746	6.6	107			2,977	
Louisiana Gulf Coast	22,847	8.9	303			2,230	
Arkansas, Louisiana Inland, etc	1,573	3.8	409			822	
New Mexico	172	1.9	25			49	
Rocky Mountain	1,616	1.5	----------	---------	---------	449	
West Coast	15,911	3.5	----------	171	48	1,942	
Total	141,410	4.7	1,280	2,964	231	32,433	144,435

See footnotes at end of table.

TABLE 57. Salient statistics of kerosine in the United States, 1961–62, by months and refinery districts—Continued

(Thousand barrels)

Month and district	Production from crude	Yield (percent)	Production from natural-gas liquids	Imports	Exports	Stocks (end of period)	Domestic demand	Sales of commercial jet aircraft [1]	
	1962 [2]							1961	1962
Month:									
January	14,507	5.4	123	454	17	26,386	21,114	3,324	4,681
February	14,664	6.1	78	164	11	25,295	15,986	2,585	4,414
March	12,726	4.9	69	284	15	23,315	15,044	3,639	5,007
April	11,051	4.6	93	455	20	24,248	10,646	3,389	5,211
May	11,359	4.4	59	578	15	27,264	8,965	3,881	5,630
June	11,458	4.4	56	565	15	30,112	9,216	4,082	5,583
July	13,243	4.9	51	730	38	33,204	10,894	4,329	5,724
August	12,516	4.7	56	606	66	35,682	10,634	4,458	5,841
September	12,319	4.8	92	669	33	36,682	12,047	4,270	5,617
October	13,436	5.3	75	754	41	37,333	13,573	4,441	6,161
November	13,606	5.4	110	487	24	35,349	16,163	4,398	5,940
December	15,488	5.7	144	523	41	31,725	19,738	4,391	5,898
Total	156,373	5.0	1,006	6,269	336	31,725	164,020	47,187	65,707
District:									
East Coast	13,636	3.1	--------	4,013	74	12,084	(3)	32,342	46,486
Appalachian No. 1	1,278	3.4	--------			698			
Appalachian No. 2	2,276	6.4	--------			400			
Indiana, Illinois, Kentucky, etc.	30,515	5.6	--------			5,815			
Minnesota, Wisconsin, North Dakota, etc.	2,081	4.4	--------	-------	9	1,578			
Oklahoma, Kansas, etc.	7,005	2.6	--------			1,604			
Texas Inland	4,294	3.7	368			601			
Texas Gulf Coast	48,664	7.0	99			3,695			
Louisiana Gulf Coast	24,742	9.0	229			2,302			
Arkansas, Louisiana Inland, etc.	1,967	4.6	293	-------	188	533			
New Mexico	228	2.4	17			56			
Rocky Mountain	2,220	2.0	--------	--------	--------	476			
West Coast	17,467	3.7	--------	2,256	65	1,883	--------	14,845	19,221
Total	156,373	5.0	1,006	6,269	336	31,725	164,020	47,187	65,707

---

[1] Included in total demand for kerosine.
[2] Preliminary data.
[3] Not available.

TABLE 58.—Shipments of kerosine in the United States, 1961–62, by PAD districts, States and uses

(Thousand barrels)

District and State	Range oil		Tractor fuel		All other uses		Total	
	1961	1962	1961	1962	1961	1962	1961	1962
District 1:								
Connecticut	1,481	1,309	10	--------	430	380	1,921	1,689
Delaware	793	904	7	3	89	65	889	972
District of Columbia	127	114	3	3	14	27	144	144
Florida	3,254	3,510	31	86	409	493	3,694	4,089
Georgia	1,001	831	93	103	378	375	1,472	1,309
Maine	2,722	2,437	--------	--------	72	85	2,794	2,522
Maryland	2,639	2,715	43	16	130	131	2,812	2,862
Massachusetts	5,157	5,108	4	--------	251	205	5,412	5,313
New Hampshire	904	912	--------	--------	3	19	907	931
New Jersey	2,296	1,950	6	10	212	236	2,514	2,196
New York	5,915	5,286	3	14	574	421	6,492	5,721
North Carolina	11,935	12,501	40	82	1,117	1,515	13,092	14,098
Pennsylvania	3,086	3,289	13	39	443	358	3,542	3,686
Rhode Island	817	799	3	--------	11	68	831	867
South Carolina	3,825	4,148	8	8	540	578	4,373	4,734
Vermont	952	880	--------	--------	49	17	1,001	897
Virginia	5,249	5,476	23	47	155	201	5,427	5,724
West Virginia	209	212	3	3	59	35	271	250
Total	[1] 52,362	52,381	[1] 290	414	[1] 4,936	5,209	[1] 57,588	58,004
District 2:								
Illinois	3,923	4,114	20	73	1,064	816	5,007	5,003
Indiana	3,313	3,520	8	5	355	826	3,676	4,351
Iowa	2,159	1,954	27	17	117	115	2,303	2,086
Kansas	435	290	23	34	70	106	528	430
Kentucky	935	964	2	2	278	358	1,215	1,324
Michigan	4,130	4,781	56	26	1,972	2,166	6,158	6,973
Minnesota	1,905	2,148	38	19	48	134	1,991	2,301
Missouri	1,321	1,241	9	31	136	236	1,466	1,508
Nebraska	448	478	43	32	118	99	609	609
North Dakota	811	850	--------	--------	15	10	826	860
Ohio	1,890	2,455	--------	5	598	830	2,488	3,290
Oklahoma	177	173	70	34	132	178	379	385
South Dakota	825	874	2	--------	36	22	863	896
Tennessee	1,132	1,322	10	2	691	950	1,833	2,274
Wisconsin	2,895	2,664	6	10	70	85	2,971	2,759
Total	26,299	27,828	314	290	5,700	6,931	32,313	35,049
District 3:								
Alabama	369	218	7	26	107	78	483	322
Arkansas	97	61	27	7	56	57	180	125
Louisiana	112	85	14	5	262	199	388	289
Mississippi	67	54	22	15	121	104	210	173
New Mexico	74	50	9	2	101	78	184	130
Texas	315	453	93	84	924	918	1,332	1,455
Total	[1] 1,034	921	[1] 172	139	[1] 1,571	1,434	[1] 2,777	2,494
District 4:								
Colorado	175	131	7	1	48	37	230	169
Idaho	393	265	--------	--------	3	6	396	271
Montana	300	262	--------	--------	59	3	359	265
Utah	192	308	--------	--------	16	21	208	329
Wyoming	102	81	--------	1	13	27	115	109
Total	1,162	1,047	7	2	139	94	1,308	1,143
District 5:								
Alaska	9	3	--------	--------	32	21	41	24
Arizona	16	14	--------	1	20	10	36	25
California	252	182	--------	--------	809	812	1,061	994
Hawaii	42	41	--------	--------	26	14	68	55
Nevada	3	4	--------	--------	--------	5	3	9
Oregon	8	11	--------	--------	18	15	26	26
Washington	10	12	--------	--------	38	31	48	43
Total	340	267	--------	1	943	908	1,283	1,176
Total United States	81,197	82,444	783	846	13,289	14,576	95,269	97,866

[1] Revised.

TABLE 59.—Monthly average prices of kerosine in the United States, 1961–62, in cents per gallon

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1961:													
42°–44° gravity, water-white kerosine at refineries, Oklahoma	11.31	11.30	10.97	10.81	10.53	10.44	10.44	10.44	10.44	10.44	10.56	10.85	10.71
Kerosine (and/or No. 1 fuel oil) at New York Harbor	11.44	11.89	11.96	11.50	11.02	11.00	11.04	11.30	11.30	11.30	11.30	11.66	11.39
Kerosine, tank-wagon at Chicago	17.10	17.60	17.60	17.10	17.10	16.60	16.60	16.60	16.60	16.60	16.60	17.10	16.90
Kerosine, tank-wagon at New York City [1]	16.40	16.90	16.40	16.40	16.40	16.40	16.70	16.70	16.70	16.70	16.70	16.70	16.60
1962:													
42°–44° gravity, water-white kerosine at refineries, Oklahoma	11.48	11.73	11.34	11.25	11.01	10.75	10.75	10.75	10.75	10.75	10.75	10.87	11.01
Kerosine (and/or No. 1 fuel oil) at New York Harbor	11.80	11.79	11.50	11.17	10.93	10.75	10.75	10.75	10.75	10.75	11.15	11.50	11.13
Kerosine, tank-wagon at Chicago	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60
Kerosine, tank-wagon at New York City [1]	16.70	16.70	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.40	16.60	16.60	16.48

[1] Mahattan and Queens.

Source: Platt's Oil Price Handbook.

DISTILLATE FUEL OIL

The 5.6 percent increase in the total demand for distillate fuel oils in 1962 is the best gain registered in several years. Total demand for the year was 740.3 million barrels, which included a domestic demand of 732.1 million barrels and exports of 8.2 million. The weather based on degree days was 5.1 percent colder than normal in the first quarter and 6.6 percent colder than the same quarter of 1961. The fourth quarter was 5.5 percent colder than normal and 7.6 percent colder than the same quarter of the previous year. Domestic demand in the first quarter averaged 2,878,000 barrels daily, a gain of 8.9 percent, and in the fourth quarter it averaged 2,316,000 barrels daily, 6.5 percent higher than in 1961. In the second quarter demand increased 2.5 percent, but in the third quarter the percent gain was only 0.1.

The new supply of distillate fuel oil includes the production at refineries and natural-gas liquids plants, direct transfers from crude oil and imports. As demand exceeded the new supply in 1962, stocks were reduced 7.5 million barrels.

The annual average of posted prices for distillate fuel oil, as shown in Platt's Oil Price Handbook, indicates that the only increase in posted price was at the refineries in Oklahoma.

The tanker rate for No. 2 distillate fuel from the gulf coast to New York Harbor averaged 39.1 cents per barrel in 1962, compared with 43.3 cents for the previous year.

Distillate fuel oil deliveries by pipeline increased from 238.4 million barrels in 1961 to 264.6 million in 1962. Coastwise shipments from the gulf and west coast to the east coast in 1962 were 199.3 million barrels, a gain of 8.2 million barrels for the year. Barge shipments on the Mississippi River between PAD District 3 and Districts 1 and 2 totaled 10.6 million barrels for the year.

TABLE 60.—Salient statistics of distillate fuel oil in the United States, 1961–62, by months and refinery districts

(Thousand barrels, unless otherwise stated)

Month and district	Production from crude	Yield (percent)	Production from natural-gas liquids	Crude used directly as distillate[1]	Imports	Exports	Stocks (end of period)	Domestic demand
	1961							
Month:								
January	64,433	24.7	102	81	2,208	728	108,097	96,454
February	63,248	26.4	56	79	1,037	300	97,298	74,919
March	55,967	22.4	49	77	1,484	458	87,950	66,467
April	49,861	21.6	69	68	1,137	556	85,003	53,526
May	52,868	21.4	47	66	794	811	93,636	44,331
June	52,503	22.0	43	61	1,101	699	109,513	37,132
July	58,234	22.3	42	66	1,637	591	129,631	39,270
August	61,208	22.9	44	70	1,210	352	150,893	40,918
September	54,571	22.5	37	71	1,502	341	165,445	41,288
October	59,898	23.4	41	69	1,279	750	177,921	48,061
November	59,508	23.9	40	69	1,458	602	174,192	64,202
December	63,716	24.1	37	74	2,530	743	152,018	87,788
Total	696,015	23.2	607	851	17,377	6,931	152,018	694,356
District:								
East Coast	125,142	28.3	--------	--------	15,533	170	61,278	(3)
Appalachian No. 1	8,551	23.2	--------	--------			3,857	
Appalachian No. 2	6,824	18.9	--------	--------	24	590	1,732	
Indiana, Illinois, Kentucky, etc	116,782	21.4	--------	216			23,646	
Minnesota, Wisconsin, etc	10,614	23.6	--------	150			6,756	
Oklahoma, Kansas, etc	64,126	24.5	--------	145			12,219	
Texas Inland	17,802	15.9	252	98	1,654	385	1,685	
Texas Gulf Coast	180,878	27.2	140	56			14,293	
Louisiana Gulf Coast	59,139	23.0	18	31			6,755	
Arkansas, Louisiana Inland, etc	9,157	22.1	197	11			3,122	
New Mexico	1,601	18.0	--------	54			192	
Rocky Mountain	23,169	22.2	--------	90	142	34	2,511	
West Coast	72,230	16.0	--------	--------	24	5,752	13,972	
Total	696,015	23.2	607	851	17,377	6,931	152,018	694,356

See footnotes at end of table.

TABLE 60.—Salient statistics of distillate fuel oil in the United States, 1961–62, by months and refinery districts—Continued

(Thousand barrels, unless otherwise stated)

Month and district	Production from crude	Yield (percent)	Production from natural-gas liquids	Crude used directly as distillate [1]	Imports	Exports	Stocks (end of period)	Domestic demand
	1962 [2]							
Month:								
January	68,406	25.5	48	217	2,314	827	121,041	101,135
February	61,151	25.1	40	147	644	721	99,952	82,350
March	62,080	23.9	43	173	685	870	86,497	75,566
April	54,323	22.7	43	115	1,514	461	88,310	53,721
May	57,503	22.3	42	66	1,457	441	102,317	44,620
June	58,464	22.5	38	69	986	342	121,496	40,036
July	59,312	22.0	41	64	732	424	140,630	40,591
August	58,951	22.2	36	68	453	543	163,025	36,570
September	58,136	22.6	43	73	1,015	869	177,030	44,393
October	59,249	23.0	42	73	690	535	185,222	51,327
November	57,311	22.9	40	65	533	987	170,221	71,963
December	64,704	24.0	41	68	462	1,178	144,505	89,813
Total	719,590	23.2	497	1,198	11,485	8,198	144,505	732,085
District:								
East Coast	121,213	27.2	--------	--------	9,622	76	50,077	(3)
Appalachian No. 1	8,523	22.8	--------	--------			3,667	
Appalachian No. 2	6,302	17.5	--------	--------	31	163	1,810	
Indiana, Illinois, Kentucky, etc	117,200	21.5	--------	593			22,612	
Minnesota, Wisconsin, etc	10,941	23.4	--------	169			8,210	
Oklahoma, Kansas, etc	65,980	24.3	--------	136			12,196	
Texas Inland	19,785	17.1	230	71	1,735	997	1,824	
Texas Gulf Coast	192,861	27.5	80	57			16,893	
Louisiana Gulf Coast	63,910	23.4	11	35			7,268	
Arkansas, Louisiana Inland, etc	9,371	21.9	--------	9			2,409	
New Mexico	1,575	16.8	176	41			179	
Rocky Mountain	24,531	22.1	--------	87	92	33	2,709	
West Coast	77,398	16.7	--------	--------	5	6,929	14,651	
Total	719,590	23.2	497	1,198	11,485	8,198	144,505	732, 85

---

[1] Figures represent crude oil used as fuel on pipelines, which is considered part of the demand for distillate.

[2] Preliminary data.

[3] Not available.

TABLE 61.—Shipments of distillate fuel oil [1] in the United States, 1958–62, by uses

(Thousand barrels)

Uses	1958	1959	1960	1961	1962	Percent change
Heating oils	399,153	401,368	422,855	[2] 434,805	450,031	3.5
Range oil (No. 1 fuel oil)	13,517	14,153	15,155	15,487	16,799	8.5
Industrial (excluding oil company)	37,553	33,380	34,271	[2] 31,226	34,951	11.9
Oil company (excluding heating oil)	7,815	8,642	8,347	8,743	9,055	3.6
Gas and electric public utility powerplants	5,382	5,005	4,742	4,151	4,100	−1.2
Railroads	83,719	87,802	86,490	85,180	86,803	1.9
Bunkering of vessels (including company tankers but excluding military)	18,768	19,250	18,730	14,566	15,836	8.7
Military (U.S. Army, Navy, Air Force and Marine Corps)	13,412	11,394	10,793	11,484	13,041	13.6
Miscellaneous uses:						
Diesel fuel	65,186	70,527	74,562	[2] 77,825	89,729	15.3
Other light distillates	9,054	7,471	7,380	[2] 7,407	8,750	18.1
Total United States	653,559	658,992	683,325	690,874	729,095	5.5

---

[1] Includes diesel fuel.

[2] Revised.

TABLE 62.—Shipments of distillate fuel oil[1] in the United States, by PAD districts and States

(Thousand barrels)

District and State	1958	1959	1960	1961	1962
District 1:					
Connecticut	23,885	22,176	23,230	23,199	23,099
Delaware	2,413	2,487	2,723	2,537	3,097
District of Columbia	3,402	2,719	2,914	2,726	2,878
Florida	8,150	8,190	8,971	9,369	10,611
Georgia	4,887	4,731	5,117	5,269	6.218
Maine	6,434	7,108	7,456	8,307	8,645
Maryland	16,086	12,495	13,101	14,257	15,146
Massachusetts	47,452	47,781	51,022	52,266	53,448
New Hampshire	3,951	4,049	4,484	5,486	5.834
New Jersey	42,923	45,634	45,542	46,992	48,622
New York	85,779	79,499	81,677	86,029	94,501
North Carolina	10,406	11,544	13,353	13,366	15,617
Pennsylvania	45,322	44,029	45,668	45,982	49,315
Rhode Island	7,250	7,167	8,093	7,547	7,411
South Carolina	4,266	4,454	5,203	5,116	5,776
Vermont	2,796	2,399	2,939	3,299	3,602
Virginia	13,300	12,984	14,184	14,631	15,843
West Virginia	1,913	2,154	2,462	2,525	2,490
Total	330,615	321,600	338,139	348,903	372,153
District 2:					
Illinois	42,869	43,008	42,490	42,255	41,361
Indiana	24,099	24,500	25,596	25,452	25,743
Iowa	9,883	11,360	11,141	10,043	11,022
Kansas	4,477	5,060	4,751	5,187	5,242
Kentucky	4,978	5,800	4,833	4,426	5,822
Michigan	29,385	28,387	30,464	30,547	31,131
Minnesota	16,468	15,079	16,241	15,967	16,776
Missouri	14,274	12,700	12,830	12,858	13,412
Nebraska	3,527	3,929	4,183	4,481	4,099
North Dakota	2,976	3,632	3,775	3,693	4,472
Ohio	24,221	24,850	23,836	23,433	24,250
Oklahoma	1,754	2,603	2,631	3,152	3,243
South Dakota	2,800	2,882	2,964	3,085	3,212
Tennessee	3,226	5,037	5,268	5,552	6,167
Wisconsin	20,136	20,316	21,711	22,153	23,399
Total	205,073	209,143	212,714	[2]212,284	219,351
District 3:					
Alabama	4,346	4,891	5,370	4,310	4,938
Arkansas	2,433	2,175	2,052	3,078	2,451
Louisiana	10,756	11,249	10,694	9,038	9,622
Mississippi	1,744	2,318	2,364	1,954	2,715
New Mexico	2,492	2,302	3.065	2,841	3,512
Texas	24,077	26,541	24,315	21,795	23,959
Total	45,848	49,476	47,860	43,016	47,197
District 4:					
Colorado	3,238	3,099	4,225	4,441	4,148
Idaho	3,938	3,734	4,055	4,037	4,204
Montana	3,642	4,474	4,877	5,248	5,522
Utah	4,655	3,478	3,841	3,085	3,607
Wyoming	3,697	3,539	3,258	3,250	3,838
Total	19,170	18,324	20,256	[2]20,061	21,319
District 5:					
Alaska	(3)	2,618	2,616	2,849	2.897
Arizona	2,018	2,100	2,774	3,107	3.001
California	24,884	26,357	26,697	27,410	29,685
Hawaii	(4)	(4)	876	1,666	1,641
Nevada	1,656	2,051	2,428	2,985	3,017
Oregon	9,380	10,456	10,920	11.061	11,777
Washington	14,915	16,867	18,045	17,532	17,057
Total	52,853	60,449	64,356	66,610	69,075
Total United States	653,559	658,992	683,325	690,874	729,095

[1] Includes diesel fuel oil.
[2] Revised.
[3] Not included in United States totals before 1959.
[4] Not included in United States totals before 1960.

TABLE 63.—Monthly average prices of distillate fuel oil and diesel fuel in the United States, 1961–62

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1961:													
No. 2 fuel oil at refineries, Olkahoma……cents per gallon..	9.88	9.87	9.66	9.50	9.22	9.13	9.13	9.13	9.13	9.13	9.25	9.51	9.38
No. 2 fuel oil at New York Harbor……do….	10.44	10.89	10.96	10.50	10.02	10.00	10.04	10.30	10.30	10.30	10.30	10.66	10.39
Diesel oil, shore plants, New York……do….	10.78	11.24	11.32	10.85	10.61	10.60	10.63	10.90	10.90	10.90	10.90	11.07	10.89
Diesel oil for ships:													
New York……dollars per barrel..	4.58	4.76	4.79	4.60	4.39	4.39	4.42	4.52	4.52	4.52	4.52	4.67	4.56
New Orleans……do….	4.18	4.43	4.48	4.40	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.22	4.20
San Pedro……do….	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09
1962:													
No. 2 fuel oil at refineries, Oklahoma……cents per gallon..	10.18	10.53	9.96	9.88	9.63	9.38	9.38	9.38	9.38	9.38	9.38	9.50	9.66
No. 2 fuel oil at New York Harbor……do….	10.80	10.79	10.50	10.17	9.93	9.75	9.75	9.75	9.75	9.75	10.15	10 50	10.13
Diesel oil, shore plants, New York……do….	11.15	11.14	10.85	10.53	10.29	10.10	10.10	10.10	10.10	10.10	10.50	10.85	10.48
Diesel oil for ships:													
New York……dollars per barrel..	4.73	4.72	4.60	4.33	4.18	4.18	4.18	4.18	4.18	4.18	4.37	4.60	4.37
New Orleans……do….	4.27	4.27	4.27	4.20	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.26	4.14
San Pedro……do….	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09	5.09

Source: Platt's Oil Price Handbook.

RESIDUAL FUEL OIL

The demand for residual fuel oil continued to decline in 1962. Total demand was 558.3 million barrels, 4.4 million barrels less than in 1961. Domestic demand was 545.4 million barrels, and exports were 12.9 million. Demand for the East Coast (PAD District I), which is the principal consuming area for residual, increased 5.3 percent in 1962.

PAD District I accounted for 63 percent of the nationwide consumption for the year. Refinery production in the district furnished only 17 percent of the 1962 demand, other districts supplied 14 percent, and the balance (69 percent) was imported. Imports into PAD District I (excluding fuel for vessels engaged in foreign trade and offshore military requirements) are controlled by the Oil Import Administration. The import quota for residual fuel oil is based on a forecast of supply and demand covering a 1-year period from April 1 of the current year to March 31 of the following year. It represents the difference between the estimated domestic supply (including receipts from Puerto Rico) and the forecast of demand.

Domestic supplies of residual fuel oil continue to decline as more facilities are installed to further refine residual stocks into lighter end products. The yield of residual fuel oil from crude oil was reduced from 10.5 percent in 1961 to 9.6 percent in 1962. In 1957, the percentage yield was 14.4. By PAD Districts, the change in yield patterns over the past 5 years has been even more pronounced; in District 5 they declined from 30.4 percent to 20.6; in District 3 from 10.6 to 5.3; in District 1 from 16.6 to 11.9; and in District 2 from 10.0 to 7.6 percent.

Imports of residual fuel oil in 1962 averaged 723,000 barrels daily, compared with 666,000 barrels in 1961. The above import figures include bonded bunker fuel, offshore military use, and overland imports which are exempt from quota regulations of the Oil Import Administration.

The decline in interdistrict shipments of residual fuel oil in 1962 was in the tidewater shipments from PAD District 3 to PAD District 1. These shipments declined from 47.1 million barrels in 1961 to 39.3 million barrels.

The average tanker rate for Bunker "C" fuel oil from the gulf coast district to destinations north of Cape Hatteras in 1962 was 42.8 cents per barrel compared with 45.7 cents per barrel in 1961.

TABLE 64.—Salient statistics of residual fuel oil in the United States, by months and refinery districts

(Thousand barrels unless otherwise stated)

Month and district	Production	Yield (percent)	Crude used directly as residual [1]		Imports	Exports	Stocks (end of month)	Domestic demand	Production	Yield (percent)	Crude used directly as residual [1]		Imports	Exports	Stocks (end of month)	Domestic demand
			Districts I-IV	District V							Districts I-IV	District V				
	1961								1962 [2]							
Month:																
January	29,894	11.4	327	39	28,000	1,176	42,934	59,020	30,371	11.3	289	134	31,007	1,213	41,605	63,852
February	27,758	11.6	297	47	26,449	1,014	42,635	53,836	26,543	11.0	313	112	22,910	1,604	39,457	50,422
March	27,383	11.0	247	107	23,826	1,322	40,889	51,987	26,862	10.4	220	83	27,506	1,388	37,127	55,613
April	24,990	10.8	339	24	23,633	1,253	41,848	46,774	22,897	9.5	226	79	20,419	1,011	39,267	40,470
May	26,551	10.7	261	16	17,556	1,615	44,137	40,480	23,312	9.0	295	63	18,156	1,472	40,976	38,645
June	23,318	9.8	233	76	13,152	1,125	47,362	32,429	22,219	8.6	230	53	16,765	820	44,891	34,532
July	25,824	9.9	252	20	17,794	805	50,242	40,205	23,208	8.6	226	65	16,954	1,010	50,662	33,672
August	25,212	9.5	235	79	13,691	1,398	48,771	39,290	22,893	8.6	237	53	16,330	1,053	54,085	35,037
September	23,851	9.8	246	92	15,510	880	50,341	37,249	23,139	8.9	221	27	17,846	837	55,675	38,806
October	25,106	9.8	262	81	17,315	1,194	48,969	42,942	22,490	8.8	223	57	19,344	618	54,077	43,094
November	25,713	10.3	233	23	21,592	954	46,694	48,882	23,584	9.4	222	79	26,508	939	51,154	52,377
December	29,977	11.3	248	70	24,750	1,286	44,869	55,584	28,161	10.4	225	65	30,158	905	49,996	58,862
Total	315,577	10.5	3,180	674	243,268	14,022	44,869	548,678	295,679	9.6	2,927	870	263,903	12,870	49,996	545,382
District:																
East Coast	53,873	12.2	183	------	214,453	75	12,131	(3)	53,451	12.1	190	------	237,736	41	9,957	(3)
Appalachian No. 1	3,701	10.1	------	------			436		3,759	10.1	------	------			419	
Appalachian No. 2	3,954	10.9	------	------	284	507	380		3,576	10.0	------	------	610	172	235	
Indiana, Illinois, Kentucky, etc.	55,885	10.3	287	------			6,000		51,211	9.4	228	------			5,999	
Minnesota, Wisconsin, etc.	6,426	14.3	36	------			656		6,266	13.3	36	------			837	
Oklahoma, Kansas, etc.	6,722	2.6	360	------			810		7,271	2.7	360	------			960	
Texas Inland	7,074	6.3	389	------	12,320	1,858	2,565		5,851	5.1	341	------	11,602	1,912	2,620	
Texas Gulf Coast	46,176	6.9	561	------			5,102		36,609	5.2	524	------			3,938	
Louisiana Gulf Coast	16,537	6.4	682	------			1,212		15,341	5.6	641	------			1,359	
Arkansas, Louisiana Inland, etc.	2,210	5.3	207	------			229		1,958	4.6	201	------			145	
New Mexico	820	9.2	79	------			61		781	8.4	83	------			27	
Rocky Mountain	12,282	11.8	396	------	1	4	1,023		14,197	12.9	323	------	47	2	902	
West Coast	99,917	22.2	------	674	16,210	11,578	14,264		95,408	20.5	------	870	13,908	10,743	22.598	
Total	315,577	10.5	3,180	674	243,268	14,022	44,869	548,678	295,679	9.6	2,927	870	263,903	12,870	49,996	545,382

---

[1] Represents crude oil used as fuel on leases and for general industrial purposes.
[2] Preliminary data.
[3] Not available.

TABLE 65.—Shipments of residual fuel oil [1] in the United States, by uses

(Thousand barrels)

	1958	1959	1960	1961	1962	Percent change
Heating oils	105,639	111,850	125,088	121,097	125,164	3.4
Industrial (excluding oil company fuel)	143,142	167,701	157,270	153,766	156,221	1.6
Oil-company use (excluding heating oil)	46,463	46,177	45,061	44,399	45,978	3.6
Gas and electric public utility powerplants	76,995	82,208	85,408	87,881	88,261	.4
Railroads	5,772	5,613	5,610	5,347	5,501	2.9
Bunkering of vessels (including company tankers but excluding military)	106,269	102,049	94,084	87,308	84,415	−3.3
Military use (U.S. Army, Navy, Air Force, and Marine Corps)	37,428	31,415	31,724	36,762	35,667	−3.0
Miscellaneous uses	9,659	7,339	6,291	6,426	7,226	12.4
Total United States	531,367	554,352	550,536	542,986	548,433	1.0

---

[1] Includes Navy grade and crude oil burned as fuel.

TABLE 66.—Shipments of residual fuel oil[1] in the United States by PAD districts and States

(Thousand barrels)

District and State	1958	1959	1960	1961	1962
District 1:					
Connecticut	17,041	15,814	14,450	14,549	16,019
Delaware	5,992	7,063	6,081	4,986	4,775
District of Columbia	2,243	2,450	2,387	1,955	2,243
Florida	37,470	33,310	28,978	32,600	37,044
Georgia	7,145	6,824	6,413	5.048	5,285
Maine	5,290	6,433	5,742	6,366	5,985
Maryland	14,974	17,385	16,490	12,955	13.751
Massachusetts	29,308	35,532	38,942	40,242	41,852
New Hampshire	2,022	2,984	2,324	2,067	2,545
New Jersey	36,841	41,422	42,791	42,990	50,422
New York	71,533	79,784	76,586	83,518	89,667
North Carolina	3,034	3,908	4,537	4,738	3,725
Pennsylvania	39,873	45,660	42,731	38,970	41,422
Rhode Island	11,127	10,350	9,502	7,543	8,274
South Carolina	4,660	4,886	4,634	5,031	5,908
Vermont	455	275	498	540	629
Virginia	21,411	17,703	17,448	14,195	13,225
West Virginia	894	1,620	1,451	1,216	1,480
Total	311,313	333,403	321,985	319,509	344,251
District 2:					
Illinois	26,926	23,689	25,893	25,750	24.756
Indiana	11,955	13,035	12,885	11,988	10,736
Iowa	869	1,088	1,021	1,032	873
Kansas	1,420	1,943	2,249	1,433	1,533
Kentucky	503	570	321	278	389
Michigan	9,340	13,498	11,242	9,896	9,275
Minnesota	4,963	6,399	6,363	5,524	6,307
Missouri	3.774	3,129	3,026	2,638	2,131
Nebraska	151	218	378	419	626
North Dakota	625	597	663	552	524
Ohio	9,721	11,028	11,382	9,023	8,227
Oklahoma	1.001	1,319	1,396	873	967
South Dakota	100	48	60	36	152
Tennessee	384	284	184	171	105
Wisconsin	3,458	4,167	4,275	4,028	3,813
Total	75,190	81,012	81,338	73,641	70,414
District 3:					
Alabama	4,240	4,178	4,202	3,555	2,749
Arkansas	455	346	474	379	566
Louisiana	13,411	10,764	8,599	8,537	6,563
Mississippi	268	435	339	338	474
New Mexico	359	107	173	311	323
Texas	29,082	25,275	22,102	21,437	18,711
Total	47,815	41,105	35,889	34,557	29,386
District 4:					
Colorado	1,330	1.603	1,790	2,465	2,497
Idaho	210	185	201	422	223
Montana	1,643	2,006	2,022	2,533	3,049
Utah	5,077	5,872	5,562	5,654	6,048
Wyoming	2,325	1,842	1,738	2,555	3,288
Total	10,585	11,508	11,313	13.629	15.105
District 5:					
Alaska	(2)	574	695	641	715
Arizona	37	34	95	94	117
California	72,232	72,287	78,774	81,587	68,949
Hawaii	(3)	(3)	5,613	6,646	6,716
Nevada	195	146	202	258	165
Oregon	5,253	5,121	5,453	4,879	4,989
Washington	8,747	9,162	9,179	7,545	7,626
Total	86,464	87,324	100,011	101,650	89,277
Total United States	531,367	554,352	550,536	542,986	548,433

---

[1] Includes some crude oil burned as fuel.

[2] Not included in U.S. totals before 1959.

[3] Not included in U.S. totals before 1960.

TABLE 67.—Monthly average prices of residual fuel oil in the United States in dollars per barrel

Year and grade	January	February	March	April	May	June	July	August	September	October	November	December	Average for year
1961:													
No. 6 fuel oil at refineries, Oklahoma	1.95	1.95	1.95	1.89	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.88
No. 5 fuel oil at New York Harbor	3.07	3.13	3.13	3.08	3.02	3.02	3.03	3.06	3.06	3.06	3.06	3.11	3.07
Bunker "C" for ships:													
New York	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52
New Orleans	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.03	2.30
San Pedro	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
1962:													
No. 6 fuel oil at refineries, Oklahoma	1.86	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
No. 5 fuel oil at New York Harbor	3.12	3.12	3.05	2.86	2.75	2.74	2.74	2.74	2.74	2.74	2.79	2.85	2.85
Bunker "C" for ships:													
New York	2.52	2.52	2.51	2.50	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.47
New Orleans	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
San Pedro	2.23	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.29

Source: Platt's Oil Price Handbook.

LUBRICANTS

Total demand for lubricants in 1962 was 61.3 million barrels, a 4.6 percent increase for the year. Exports totaled 17.7 million, 3.6 percent higher than in 1961, and domestic demand totaled 43.6 million, a gain of 5.0 percent.

Total production of lubricating oils in 1962 was 61.5 million barrels. This includes 7.0 million barrels of bright stocks, 22.8 million barrels of neutral oils, and 31.7 million barrels classified as other grades. The total production in 1961 was 59.3 million barrels, broken down by grades as follows: Bright stock, 6.7 million; neutral, 21.4 million; and other grades, 31.2 million barrels.

The yearly average of posted prices at refineries in Oklahoma increased 0.09 cent per gallon 1962. Posted prices for neutral oils at Pennsylvania refineries remained the same as a year ago, but prices for cylinder stocks advanced 1.58 cents per gallon.

TABLE 68.—Salient statistics of lubricants in the United States by months and districts

(Thousand barrels unless otherwise stated)

Month and district	1961 Production	1961 Yield (percent)	1961 Imports	1961 Exports	1961 Stocks, end of period	1961 Domestic demand	1962[1] Production	1962[1] Yield (percent)	1962[1] Imports	1962[1] Exports	1962[1] Stocks, end of period	1962[1] Domestic demand
By months:												
January	4,716	1.8	1	1,048	12,376	3,596	5,019	1.9	1	1,340	13,133	3,490
February	4,723	2.0	1	1,555	12,791	2,754	4,727	1.9	1	946	13,391	3,524
March	5,025	2.0	2	1,595	12,695	3,528	4,962	2.0	1	1,157	13,631	3,566
April	5,065	2.2	----------	1,365	13,388	3,007	5,262	2.2	2	1,800	13,282	3,813
May	5,276	2.2	2	1,552	13,072	4,042	5,026	2.0	1	1,653	12,672	3,984
June	4,562	1.9	1	1,318	12,735	3,582	5,081	2.0	1	1,547	12,463	3,744
July	5,153	1.9	2	1,534	12,882	3,474	5,293	1.9	1	1,631	12,490	3,636
August	5,144	1.9	----------	1,718	12,560	3,748	5,046	1.9	1	1,532	12,176	3,829
September	4,547	1.9	1	1,263	12,400	3,445	5,329	2.1	4	1,855	12,180	3,474
October	5,075	2.0	2	1,396	12,279	3,802	5,324	2.1	9	1,019	12,598	3,896
November	5,020	2.1	1	1,520	12,326	3,454	4,971	1.9	4	1,404	12,546	3,623
December	4,948	1.8	1	1,230	12,943	3,102	5,427	2.0	2	1,818	13,130	3,027
Total	59,254	2.0	14	17,094	12,943	41,534	61,467	2.0	28	17,702	13,130	43.606
By districts:												
East Coast	7,922	1.8	11	4,489	3,153	(2)	7,929	1.8	16	16,126	3,009	(2)
Appalachian No. 1	3,077	8.4			622		3,278	8.7			733	
Appalachian No. 2	368	1.0	----------		81		427	1.2	2		134	
Indiana, Illinois, Kentucky, etc	4,896	.9			1,889		4,639	0.8			1,850	
Minnesota Wisconsin, North & South Dakota	----------	----------		391	29		----------	----------			28	
Oklahoma, Kansas, etc	4,766	1.8			646		4,829	1.7			592	
Texas Inland	174	.2	3		40		156	.2	8		41	
Texas Gulf Coast	22,530	3.3			3,611		24,276	3.4			3,629	
Louisiana Gulf Coast	7,039	2.7		10,072	1,016		7,230	2.7			875	
Arkansas, Louisiana Inland, etc	1,939	4.6			489		1,950	4.6			384	
New Mexico	----------	----------			3		----------	----------	----------		1	
Rocky Mountain	339	.3	----------	----------	97		312	.3	2		109	
West Coast	6,204	1.4	----------	2,142	1,267		6,441	1.4	----------	1,576	1,745	
Total	59,254	2.0	14	17,094	12,943	41,534	61,467	2.0	28	17,702	13,130	43,606

[1] Preliminary figures.
[2] Figures not available.

TABLE 69.—Average monthly refinery prices of five selected grades of lubricating oil in the United States, in cents per gallon

Year and grade	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1961:													
Oklahoma:													
200 viscosity, No. 3 color, neutral	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50	20.50
150-160 viscosity at 210° bright stock, 10-25 pour test	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50
Pennsylvania:													
200 viscosity, No. 3 color, neutral 420-425 flash, 25 pour test	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00
600 steam-refined, cylinder stock, filterable	19.34	20.00	20.00	20.00	20.00	20.00	20.55	21.00	21.00	21.00	21.00	21.00	20.41
South Texas: 500 viscosity, No. 2½-3½ color, neutral	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
1962:													
Oklahoma:													
200 viscosity, No. 3 color, neutral	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	21.50	20.63	21.50	20.59
150-160 viscosity at 210° bright stock, 10-25 pour test	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.50	23.57	24.50	23.59
Pennsylvania:													
200 viscosity, No. 3 color, neutral 420-425 flash, 25 pour test	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00
600 steam-refined, cylinder stock, filterable	21.93	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	21.99
South Texas: 500 viscosity, No. 2½-3½ color, neutral	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Source: Platt's Oil Price Handbook.

JET FUEL (MILITARY GRADE)

The demand for military-grade jet fuels increased 7.6 percent in 1962. Domestic demand was 112.4 million barrels, and exports were 0.1 million barrels.

The total production in 1962 was 103.0 million barrels and was blended from 75.9 million barrels of gasoline, 14.7 million barrels of kerosine, 11.7 million barrels of distillate fuel oil, and 0.7 million barrels of natural-gas liquids.

The jet fuel reported in this category represents that used by the military or by aircraft and missile manufacturers which are testing equipment for the U.S. Government.

TABLE 70.—Salient statistics of military jet fuel in the United States, by months and districts

(Thousand barrels)

Month and district	Production, blended from				Transfers from gasoline plants	Imports	Exports	Stocks, end of period	Domestic demand	Production, blended from				Transfers from gasoline plants	Imports	Exports	Stocks, end of period	Domestic demand
	Gasoline	Kerosine	Distillate	Total						Gasoline	Kerosine	Distillate	Total					
	1961									1962[1]								
By months:																		
January	4,842	897	970	6,709	69	181	2	5,991	7,836	6,041	961	562	7,564	41	1,702	------	8,092	9,495
February	4,924	900	850	6,674	39	832	6	6,417	7,113	5,360	721	991	7,072	5	147	------	8,057	7,259
March	6,485	1,332	1,061	8,878	71	542	16	7,131	8,761	6,286	1,148	1,187	8,621	112	1,164	1	8,317	9,636
April	5,923	1,124	926	7,973	56	785	24	7,783	8,138	6,409	1,004	1,215	8,628	24	479	1	8,505	8,942
May	6,050	1,147	1,104	8,301	73	2,095	------	7,621	10,631	6,843	1,232	1,116	9,191	64	526	1	8,251	10,034
June	5,570	1,081	888	7,539	5	1,262	15	7,876	8,536	6,541	1,206	1,207	8,954	99	1,274	1	8,162	10,415
July	5,671	1,262	1,139	8,072	116	150	1	8,245	7,968	6,213	1,280	867	8,360	95	171	------	8,055	8,733
August	6,714	1,194	954	8,862	68	1,045	30	8,455	9,735	7,248	1,335	1,078	9,661	54	1,004	------	8,656	10,118
September	5,932	1,133	902	7,967	15	1,720	1	7,923	10,233	6,618	1,238	927	8,783	57	2,535	34	8,405	11,592
October	5,743	1,034	755	7,532	72	636	26	7,690	8,447	6,723	1,702	981	9,406	65	475	10	9,413	8,928
November	6,145	1,052	957	8,154	60	294	1	7,797	8,400	6,610	1,610	961	9,181	64	513	10	10,768	8,393
December	6,437	1,044	1,068	8,549	69	503	------	8,280	8,638	4,988	1,236	624	6,848	25	907	24	9,668	8,856
Total	70,436	13,200	11,574	95,210	713	10,045	122	8,280	104,436	75,880	14,673	11,716	102,269	705	10,897	82	9,668	112,401
By districts:																		
East Coast	2,406	674	3	3,083	--------	8,461	1	508	(2)	2,507	730	--------	3,237	--------	9,527	40	656	(2)
Appalachian No. 1	222	4	--------	226	--------			30		375	--------	--------	375	--------			26	
Appalachian No. 2	--------	332	--------	332	--------	------	------	76		--------	335	--------	335	--------	12		84	
Indiana, Illinois, Kentucky, etc	6,896	897	3,664	11,457	--------			1,229		6,921	591	3,735	11,247	--------			956	
Minnesota, Wisconsin, North and South Dakota	1,100	143	--------	1,243	--------			209		1,367	189	--------	1,556	--------			154	
Oklahoma, Kansas, Missouri, etc	9,911	1,961	2,964	14,836	--------			1,104		9,406	2,006	2,569	13,981	--------			1,158	
Texas Inland	11,159	777	1,253	13,189	--------	------	1	762		12,431	535	949	13,915	--------	------		850	
Texas Gulf	10,792	3,434	222	14,448	--------			1,171		13,741	4,117	257	18,115	--------			1,910	
Louisiana Gulf Coast	9,002	313	290	9,605	--------			870		10,968	329	690	11,987	--------			801	
Arkansas, Louisiana Inland, etc	590	--------	332	922	713			322		921	--------	52	973	705			337	
New Mexico	1,057	309	53	1,419	--------			65		1,117	326	--------	1,443	--------			179	
Rocky Mountain	4,312	569	936	5,817	--------	------	------	563		4,125	826	858	5,809	--------	------		701	
West Coast	12,989	3,787	1,857	18,633	--------	1,584	120	1,371		12,001	4,689	2,606	19,296	--------	1,358	42	1,856	
Total	70,436	13,200	11,574	95,210	713	10,045	122	8,280	104,436	75,880	14,673	11,716	102,269	705	10,897	82	9,668	112,401

Preliminary figures.

[2] Figures not available.

LIQUEFIED GASES (INCLUDING ETHANE)

Liquefied gases are derived from two sources. Those produced at refineries are called liquefied refinery gases to distinguish them from those extracted from natural gas, which are called liquefied petroleum gases. The liquefied petroleum gases are all saturated (that is, propane, butane, etc.). The liquefied refinery gases may contain unsaturated compounds or olefins (that is, propylene, butylene, etc.). The olefins are used as feed stock for chemical plants. The saturated gases may be used as chemical raw materials or as fuel. Liquefied gases are also used in producing gasoline and are reported in this chapter as natural-gas liquids used at refineries or as gasoline. Although ethane and ethylene are not defined as liquefied gases the statistics of these products are in some cases reported with those of LPG.

The production of liquefied gases including ethane-ethylene, in 1962 was 300.4 million barrels. This includes 76.8 million produced at petroleum refineries and 223.6 produced at natural-gas processing plants. The total demand for liquefied gases in 1962 was 258.9 million barrels. This excludes 51.1 million barrels delivered from natural-gas processing plants and terminals for blending into motor fuel.

More detailed information on liquefied gases may be found in the chapter on Natural-Gas Liquids.

TABLE 71.—Salient statistics of liquefied petroleum gas and ethane in the United States, by months and districts

(Thousand barrels unless otherwise stated)

Month and district	1961							1962[1]						
	Production	Yield (percent)	Transfers from gasoline plants	Imports	Exports	Stocks, end of period	Domestic demand	Production	Yield (percent)	Transfers from gasoline plants	Imports	Exports	Stocks, end of period	Domestic demand
By months:														
January	6,947	2.6	19,148	166	282	3,718	25,884	6,535	2.4	22,381	218	310	5,530	29,592
February	6,413	2.7	14,636	116	298	3,791	20,794	6,008	2.5	14,557	205	249	5,272	20,779
March	6,864	2.7	11,355	159	296	4,186	17,687	6,699	2.6	15,806	287	330	4,999	22,735
April	6,617	2.9	11,401	159	219	4,475	17,669	6,292	2.7	12,469	146	247	5,210	18.449
May	7,140	2.9	10,337	212	313	5,714	16,137	6,672	2.6	12,045	64	315	5,925	17,751
June	6,604	2.8	10,216	152	263	5,919	16,504	6,461	2.5	11,685	118	295	6,348	17,546
July	6,171	2.3	10,055	112	261	6,165	15,831	6,688	2.5	12,568	130	314	6,428	18,992
August	6,439	2.5	11,899	92	338	6,165	18,092	6,256	2.4	12,250	117	417	6,251	18,383
September	5,889	2.4	11,478	102	308	6,293	17.033	6,208	2.4	13,646	149	367	6,351	19,536
October	6,254	2.4	13,783	213	333	6,523	19,687	6,047	2.3	14,322	291	342	5,864	20.805
November	6,557	2.7	15,725	152	327	6,715	21,915	6,107	2.4	16,397	266	310	5,483	22,841
December	7,052	2.7	19,338	171	303	6,298	26,675	6,853	2.6	20,186	257	378	4,769	27,632
Total	78,947	2.6	159,371	1,806	3,541	6,298	233,908	76,826	2.5	178,312	2,248	3,874	4,769	255,041
By districts:														
East Coast	10,345	2.3	(2)	399	91	701	(2)	10,212	2.3	(2)	560	3,006	393	(2)
Appalachian No. 1	596	1.6				15		601	1.6				11	
Appalachian No. 2	165	.5		870	56	2		214	.6		952		5	
Indiana, Illinois, Kentucky, etc	8,958	1.6				706		8,125	1.5				689	
Minnesota, Wisconsin, North & South Dakota	604	1.3				18		655	1.4				14	
Oklahoma, Kansas, etc	6,831	2.6				302		6,601	2.4				254	
Texas Inland	3,567	3.2		3	2,599	168		3,144	2.7		-------		140	
Texas Gulf Coast	20,765	3.1				1,014		21,276	3.1				1,075	
Louisiana Gulf Coast	14,532	5.6				1,675		13,299	4.9				786	
Arkansas, Louisiana Inland, etc	916	2.2				273		800	1.9				9	
New Mexico	147	1.7				6		274	2.9				2	
Rocky Mountain	1,457	1.4		35	--------	21		1,568	1.4		15		20	
West Coast	10,064	2.2		499	795	1,397		10,057	2.2		721	868	1,371	
Total	78,947	2.6	159,371	1,806	3,541	6,298	233,908	76,826	2.5	178,312	2,248	3,874	4,769	255,041

[1] Preliminary figures.
[2] Figures not available

ASPHALT AND ROAD OIL

The total demand for asphalt in 1962 was 20,902,000 short tons, 6.0 percent higher than the previous year. Asphalt and asphaltic products shipped for domestic consumption increased 6.7 percent for the year. Asphalt for paving purposes, which represents 73.9 percent of the total shipments, were 6.6 percent higher than in 1961. Roofing products increased 5.7 percent, and all other uses increased 10.1 percent.

The production of road oil increased from 5.8 million barrels in 1961 to 7.1 million in 1962. The demand for road oil was 7.0 million barrels, a gain of 1.2 million barrels for the year.

TABLE 72.—Statistical summary of petroleum asphalt and road oil

(Thousand short tons) [1]

	1958	1959	1960	1961	1962 [2]
Petroleum asphalt:					
Production	16,251	17,753	17,940	18,513	19,923
Imports (including natural)	1,360	1,250	1,117	1,201	1,207
Exports	248	188	168	121	159
Stocks (end of period)	1,774	1,991	2,362	2,363	2,591
Apparent domestic consumption	17,491	18,598	18,518	19,592	20,743
Petroleum asphalt shipments:					
Paving	13,384	14,581	14,674	15,318	16,322
Roofing	3,101	3,299	3,525	3,635	3,842
All other	1,694	1,895	1,855	1,755	1,932
Total	18,179	19,775	20,054	20,708	22,096
Road oil:					
Production	1,077	1,181	1,085	1,058	1,287
Stocks (end of period)	76	119	135	138	159
Apparent domestic consumption	1,108	1,138	1,069	1,055	1,266
Road oil shipments	1,165	1,143	1,177	1,083	1,109

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Preliminary figures.

TABLE 73.—Salient statistics of petroleum asphalt in the United States, 1961–62, by months and districts

(Thousand short tons)[1]

Month and district	Production	Imports (including natural)	Exports	Stocks (end of period)	Domestic demand	Production	Imports (including natural)	Exports	Stocks (end of period)	Domestic demand
	1961					1962[2]				
Month:										
January	905	60	5	2,764	559	869	69	13	2,666	622
February	824	47	7	3,209	419	923	88	17	3,010	650
March	1,077	55	14	3,489	838	1,264	67	11	3,460	870
April	1,398	80	7	3,934	1,026	1,544	41	11	3,779	1,255
May	1,708	117	15	3,867	1,877	2,051	111	24	3,872	2,045
June	1,978	185	7	3,504	2,519	2,122	160	17	3,622	2,515
July	2,145	144	10	3,218	2,565	2,306	136	14	3,349	2,701
August	2,164	134	7	2,568	2,940	2,315	97	10	2,625	3,126
September	1,975	123	7	2,208	2,451	2,150	122	10	2,469	2,418
October	1,913	100	14	1,907	2,300	1,890	140	14	2,069	2,416
November	1,373	98	10	1,979	1,389	1,378	98	9	2,110	1,426
December	1,052	59	18	2,363	709	1,111	78	9	2,591	699
Total	18,512	1,202	121	2,363	19,592	19,923	1,207	159	2,591	20,743
District:										
East Coast	4,001	(3)	18	626	(3)	4,690	(3)	122	762	(3)
Appalachian No. 1	264			53		273			44	
Appalachian No. 2	436		3	46		495			59	
Indiana, Illinois, Kentucky, etc	3,446			373		3,699			390	
Minnesota, Wisconsin, North Dakota	258			37		257			32	
Oklahoma, Kansas, etc	2,054			355		2,037			295	
Texas Inland	889		83	91		904			91	
Texas Gulf Coast	1,296			43		1,294			81	
Louisiana Gulf Coast	974			125		1,112			127	
Arkansas, Louisiana Inland, etc	870			107		979			122	
New Mexico	82			14		102			24	
Rocky Mountain	1,300		----------	227		1,129			248	
West Coast	2,642		17	266		2,952		37	316	
Total	18,512	1,202	121	2,363	19,592	19,923	1,207	159	2,591	20,743

[1] Converted from barrels to short tons (5.5 barrels=1 short ton).
[2] Preliminary figures.
Not available.

TABLE 74.—Salient statistics of road oil in the United States, 1961–62, by months and districts

(Short tons)[1]

Month and district	Production	Stocks (end of month)	Domestic demand	Production	Stocks (end of (month)	Domestic demand
	1961			1962[2]		
Month:						
January	30,545	125,636	40,000	22,545	146,727	14,182
February	34,182	147,091	12,727	55,636	193,636	8,727
March	65,091	197,091	15,091	113,273	261,636	45,273
April	71,273	241,273	27,091	74,545	272,363	63,818
May	130,364	286,000	85,637	128,546	283,091	117,818
June	166,182	274,182	178,000	190,182	286,182	187,091
July	180,182	239,091	215,273	195,818	224,545	257,455
August	177,273	185,091	231,273	215,273	182,363	257,455
September	95,455	162,182	118,364	132,182	179,636	134,909
October	44,909	132,727	74,364	71,818	148,182	103,272
November	31,273	136,000	28,000	46,727	148,182	46,727
December	31,455	138,364	29,091	40,545	159,091	29,636
Total	1,058,184	138,364	1,054,911	1,287,090	159,091	1,266,363
District:						
East Coast	5,455	----------	(3)	6,727	----------	(3)
Appalachian No. 1	----------	----------		----------	----------	
Appalachian No. 2	910	----------		1,273	----------	
Indiana, Illinois, Kentucky, etc	318,000	22,182		339,091	29,091	
Minnesota, Wisconsin, North Dakota	35,636	----------		28,182	----------	
Oklahoma, Kansas, etc	195,091	20,182		329,091	26,364	
Texas Inland	----------	----------		----------	----------	
Texas Gulf Coast	910	364		2,727	364	
Louisiana Gulf Coast	546	545		727	182	
Arkansas, Louisiana Inland, etc	1,818	182		727	182	
New Mexico	----------	----------		----------	----------	
Rocky Mountain	288,727	28,545		348,909	34,363	
West Coast	211,091	66,364		229,636	68,545	
Total	1,058,184	138,364	1,054,911	1,287,090	159,091	1,266,363

[1] Converted from barrels to short tons (5.5 barrels = 1 short ton).
[2] Preliminary data.
[3] Not available.

TABLE 75.—Shipments of petroleum-asphalt paving products in the United States by PAD districts and States

(Short tons)

District and State	Asphalts cements		Cutback asphalts		Emulsified asphalts		Total	
	1961	1962	1961	1962	1961	1962	1961	1962
District 1:								
Connecticut	112, 040	111, 671	43, 112	81, 220	1, 893	3, 109	157, 045	196, 000
Delaware	7, 742	12, 895	15, 736	13, 492	5, 420	6, 226	28, 898	32, 613
Florida	244, 307	296, 261	122, 596	93, 559	25, 510	34, 483	392, 413	424, 303
Georgia	248, 260	505, 248	75. 348	91, 464	34, 066	40, 075	357, 674	636, 787
Maine	46, 170	47, 003	107. 641	71, 076	14, 026	14, 597	167, 837	132, 676
Maryland & D.C	231, 327	248, 838	98, 410	76, 720	43, 354	40, 623	373. 091	366, 181
Massachusetts	254, 617	262. 871	51, 799	50, 526	3, 404	2, 898	309, 820	316, 295
New Hampshire	28, 027	37, 089	39, 879	39, 603	9	17	67, 915	76, 709
New Jersey	301, 602	340, 784	110, 047	105, 154	26, 735	25, 355	438, 384	471, 293
New York	549, 365	606, 948	248, 869	309, 484	121, 195	125, 807	919. 429	1, 042, 239
North Carolina	154, 977	134, 921	144, 256	209, 697	87. 772	156, 674	387, 005	501, 292
Pennsylvania	382, 283	412, 996	165, 250	169, 626	58, 000	62, 278	605, 533	644, 900
Rhode Island	51, 784	58, 006	65, 592	56, 891	----------	258	117, 376	115, 155
South Carolina	139, 111	128, 689	34. 509	33, 125	76, 411	112, 379	250, 031	274. 193
Vermont	28, 373	18, 869	14, 081	24, 358	183	300	42, 637	43. 527
Virginia	231, 943	198, 751	127, 842	94, 921	34, 413	28, 641	394, 198	322, 313
West Virginia	83, 210	81, 105	20, 201	19. 387	8, 683	7, 720	112, 094	108, 212
Total	3, 095, 138	3, 502. 945	1, 485, 168	1, 540, 303	541, 074	661, 440	5, 121, 380	5, 704, 688
District 2:								
Illinois	264, 359	254, 900	157, 592	154, 125	22, 434	32, 783	444. 385	441, 808
Indiana	166, 145	228, 633	130, 711	137, 615	143, 570	148, 187	440, 426	514, 435
Iowa	289, 480	306, 850	113, 091	97, 035	38, 457	37, 465	441, 028	441. 350
Kansas	191, 723	247, 048	265, 655	278, 326	1, 611	97	458, 989	525, 471
Kentucky	153, 931	172, 493	81, 864	84, 089	48, 440	65, 323	284, 235	321, 905
Michigan	199, 605	253, 325	82, 890	72, 428	70, 785	61, 831	353, 280	387, 584
Minnesota	214, 705	209, 885	247, 893	205, 570	24, 820	2, 0437	487, 418	435, 892
Missouri	152, 985	159, 322	259, 541	287, 361	4, 211	6, 479	416, 737	453, 162
Nebraska	56, 791	64, 321	66, 910	54, 943	1, 973	408	125, 674	119, 672
North Dakota	61, 605	45, 711	51, 030	55, 005	47, 325	39, 397	159, 960	140, 113
Ohio	410, 592	485, 667	283, 383	331, 515	160, 710	150, 025	854, 685	967, 207
Oklahoma	210, 820	219, 759	137, 989	174, 226	3, 649	1, 738	352, 458	395, 723
South Dakota	61, 279	37, 243	48, 999	38, 985	6, 076	11, 659	116, 354	87, 887
Tennessee	213, 964	301, 291	66, 795	77. 161	22, 025	24, 022	302, 784	402. 474
Wisconsin	163, 179	162, 505	98, 845	100, 270	15, 986	10, 088	278. 010	272, 863
Total	2, 811, 163	3, 148, 953	2, 093, 188	2, 148, 654	612, 072	609, 939	5, 516, 423	5, 970, 546

TABLE 75.—Shipments of petroleum-asphalt paving products in the United States by PAD districts and States—Continued

(Short tons)

District and State	Asphalt cements		Cutback asphalts		Emulsified asphalts		Total	
	1961	1962	1961	1962	1961	1962	1961	1962
District 3:								
Alabama	142,790	148,002	74,459	70,634	57,817	71,218	275,066	289,854
Arkansas	59,632	68,496	51,899	59,667	17,535	23,502	129,066	151,665
Louisiana	136,544	135,391	17,834	22,152	17,298	36,424	171,676	193,967
Mississippi	110,212	112,587	29,262	29,439	10,332	11,574	149,806	153,600
New Mexico	105,830	98,804	59,599	56,867	7,908	8,357	173,337	164,028
Texas	702,599	655,622	230,361	222,843	37,788	37,432	970,748	915,897
Total	1,257,607	1,218,902	463,414	461,602	148,678	188,507	1,869,699	1,869,011
District 4:								
Colorado	165,519	162,117	71,136	72,732	66	128	236,721	234,977
Idaho	33,647	87,982	40,784	41,356	5,107	8,344	79,538	137,682
Montana	81,065	81,035	59,929	51,827	9,894	6,596	150,888	139,458
Utah	70,968	88,974	47,051	47,564	----------	155	118,019	[4]136,693
Wyoming	67,563	58,105	36,804	38,044	615	1,982	104,982	98,131
Total	418,762	478,213	255,704	251,523	15,682	17,205	690,148	746,941
District 5:								
Alaska	10,017	7,539	3,918	4,158	315	350	14,250	12,047
Arizona	86,569	85,368	44,824	31,725	42,865	39,278	174,258	156,371
California	1,115,738	1,129,550	141,578	110,756	115,593	115,808	1,372,909	1,356,114
Hawaii	25,405	23,014	810	383	8,868	6,514	35,083	29,911
Nevada	41,251	38,652	17,579	18,497	3,033	6,326	61,863	63,475
Oregon	183,072	179,089	48,372	44,366	16,996	16,407	248,440	239,862
Washington	117,892	136,447	85,631	92,680	9,761	6,923	213,284	236,080
Total	1,579,944	1,599,689	342,712	302,565	179,431	191,606	2,120,087	2,093,860
Total United States	9,162,614	9,948,702	4,640,186	4,704,647	1,514,937	1,668,697	15,317,737	16,322,046

TABLE 76.—Shipments of petroleum-asphalt roofing products in the United States, 1961–62, by PAD districts and States

(Short tons)

District and State	Asphalt cements and fluxes		Emulsified asphalts		Total	
	1961	1962	1961	1962	1961	1962
District 1:						
Connecticut	16,123	12,407	19	108	16,142	12,515
Delaware	1,645	2,867	124		1,769	2,867
Florida	91,867	93,302	63	63	91,930	93,365
Georgia	167,224	168,505	28	12	167,252	168,517
Maine						
Maryland and D.C	52,954	67,927	87		53,041	67,927
Massachusetts	68,324	71,064	176		68,500	71,064
New Hampshire	2		16		18	
New Jersey	287,499	338,963	257	11	287,756	338,974
New York	34,792	21,879	491		35,283	21,879
North Carolina	47,316	44,707	12		47,328	44,707
Pennsylvania	177,255	168,691	469	28	177,724	168,719
Rhode Island	42,510	39,128	37		42,547	39,128
South Carolina	55,713	52,313	52		55,765	52,313
Vermont	35	2	4		39	2
Virginia	7,270	5,167	75		7,345	5,167
West Virginia	9,338	11,597			9,338	11,597
Total	1,059,867	1,098,519	1,910	222	1,061,777	1,098,741
District 2:						
Illinois	512,789	562,667	181		512,970	562,667
Indiana	104,271	64,957	56	24	104,327	64,981
Iowa	11,172	8,156			11,172	8,156
Kansas	27,180	37,227			27,180	37,227
Kentucky	646	2,050	20	19	666	2,069
Michigan	72,553	87,130	285	15	72,838	87,145
Minnesota	123,164	154,752	143		123,307	154,752
Missouri	224,723	183,709			224,723	183,709
Nebraska	3,019	11,224			3,019	11,224
North Dakota	391	3,091			391	3,091
Ohio	189,934	192,625	1,260	2,545	191,194	195,170
Oklahoma	23,434	51,258			23,434	51,258
South Dakota	370	3,078			370	3,078
Tennessee	62,114	35,194			62,114	35,194
Wisconsin	9,842	7,541	372		10,214	7,541
Total	1,365,602	1,404,659	2,317	2,603	1,367,919	1,407,262
District 3:						
Alabama	123,983	138,196	547	78	124,530	138,274
Arkansas	61,254	60,757			61,254	60,757
Louisiana	111,544	122,840			111,544	122,840
Mississippi	10,169	10,439			10,169	10,439
New Mexico	11,184	18,485			11,184	18,485
Texas	272,265	313,166			272,265	313,166
Total	590,399	663,883	547	78	590,946	663,961
District 4:						
Colorado	41,858	44,306			41,858	44,306
Idaho	342	3,916			342	3,916
Montana	1,163	4,495			1,163	4,495
Utah	1,601	18,525			1,601	18,525
Wyoming	1,228	2,204			1,228	2,204
Total	46,192	73,446			46,192	73,446
District 5:						
Alaska	1,760	1,453			1,760	1,453
Arizona	515	567			515	567
California	412,581	430,217	994	25	413,575	430,242
Hawaii	5,284	5,511			5,284	5,511
Nevada	417	558			417	558
Oregon	114,074	122,348	1	3	114,075	122,351
Washington	33,079	37,895	3	4	33,082	37,899
Total	567,710	598,549	998	32	568,708	598,581
Total United States	3,629,770	3,839,056	5,772	2,935	3,635,542	3,841,991

TABLE 77.—Shipments of all other petroleum-asphalt products in the United States by PAD districts and States

(Short tons)

District and State	Asphalt cements and fluxes		Emulsified asphalts		Total	
	1961	1962	1961	1962	1961	1962
District 1:						
Connecticut	13,253	24,376	446	593	13,699	24,969
Delaware	2,281	2,816	6	9	2,287	2,825
Florida	97,202	90,628	301	361	97.503	90,989
Georgia	43,093	65.899	947	441	44,040	66,340
Maine	2,754	3,543	106	29	2,860	3.572
Maryland and D.C	30,952	36,726	931	665	31.883	37,391
Massachusetts	55,825	55,477	1,273	1,041	57.098	56,518
New Hampshire	247	259	19	---------	266	259
New Jersey	233,916	237,125	3,321	1.834	237,237	238,959
New York	34.126	29 120	3,421	2,773	37,547	31,893
North Carolina	72,143	60,247	7.892	4,331	80,035	64,578
Pennsylvania	116,632	111.373	4,245	4,926	120,877	116,299
Rhode Island	9,262	8.497	160	---------	9.422	8,497
South Carolina	2,229	6.898	782	107	3,011	7,005
Vermont	2,303	1,665	15	129	2.318	1,794
Virginia	26,233	32,308	261	740	26,494	33,048
West Virginia	27,348	35.569	163	47	27,511	35,616
Total	769.799	802,526	24,289	18,026	794,088	820,552
District 2:						
Illinois	150.313	174,774	13,042	11,804	163,355,	186,578
Indiana	99,042	74,535	210	165	99,252	74,700
Iowa	5,112	6,414	1,499	3,136	6,611	9,550
Kansas	14,470	15,612	197	133	14,667	15,745
Kentucky	1,906	1,331	584	1,134	2,490	2,465
Michigan	37,126	39.033	3,884	3,578	41.010	42,611
Minnesota	29,203	22,874	399	593	29,602	23,467
Missouri	57,368	54,863	1,754	2,070	59.122	56,933
Nebraska	2,033	2,526	14	111	2,047	2,637
North Dakota	554	1.779	66	2	620	1,781
Ohio	91,183	90.579	2,835	3,249	94.018	93,828
Oklahoma	18,402	38,182	324	2,589	18,726	40,771
South Dakota	515	1,013	1	7	516	1,020
Tennessee	7,304	6.367	140	134	7,444	6,501
Wisconsin	31,362	33,461	1,084	897	32,446	34,358
Total	545.893	563,343	26,033	29,602	571,926	592,945
District 3:						
Alabama	12,656	11,365	812	547	13,468	11,912
Arkansas	8.742	7,771	17	26	8,759	7,797
Louisiana	76,579	98.078	3,162	1,346	79,741	99,424
Mississippi	15,301	17,748	632	744	15,933	18,492
New Mexico	3,734	1,910	9	24	3,743	1,934
Texas	110,996	167,737	1,495	1,996	112,491	169,733
Total	228.008	304,609	6,127	4,683	234,135	309,292
District 4:						
Colorado	5,942	4.563	55	20	5,997	4,583
Idaho	3,781	106	29	24	3,810	130
Montana	46	846	176	6	222	852
Utah	301	2,623	41	28	342	2,651
Wyoming	2,403	973	4	5	2,407	978
Total	12,473	9,111	305	83	12,778	9,194
District 5:						
Alaska	46	767	21	---------	67	767
Arizona	1,448	2,204	198	201	1,646	2,405
California	104,010	151.428	5,133	11,664	109,143	163,092
Hawaii	---------	18	1	---------	1	18
Nevada	300	421	92	53	392	474
Oregon	13,055	13,573	1,936	1.901	14,991	15,474
Washington	14,803	16,172	1,123	1,836	15.926	18,008
Total	133,662	184,583	8,504	15,655	142,166	200,238
Total United States	1,689,835	1,864,172	65.258,	68,049	1,755,093	1,932,221

TABLE 78.—Shipments of petroleum-asphalts and road oil in the United States, 1961–62, by PAD districts and States

(Short tons)

District and State	Asphalts cements and fluxes	Emulsified asphalts	Cutback asphalts	Total 1962	Total 1961	Percent change	Road oil		Percent change
							1962	1961	
District 1:									
Connecticut	148,454	3,810	81,220	233,484	186,886	24.9	----	56	----
Delaware	18,578	6,235	13,492	38,305	32,954	16.2	80	47	70.2
Florida	480,191	34,907	93,559	608,657	581,846	4.6	----	1,193	----
Georgia	739,652	40,528	91,464	871,644	568,966	53.2	----	----	----
Maine	50,546	14,626	71,076	136,248	170,697	−20.2	36	168	−78.6
Maryland and D.C	353,491	41,288	76,720	471,499	458,015	2.9	136	67	103.0
Massachusetts	389,412	3,939	50,526	443,877	435,418	1.9	334	750	−55.5
New Hampshire	37,348	17	39,603	76,968	68,199	12.9	----	40	----
New Jersey	916,872	27,200	105,154	1,049,226	963,377	8.9	855	1,531	−44.2
New York	657,947	128,580	309,484	1,096,011	992,259	10.5	1,050	1,867	−43.8
North Carolina	239,875	161,005	209,697	610,577	514,368	18.7	----	----	----
Pennsylvania	693,060	67,232	169,626	929,918	904,134	2.9	8,886	6,631	34.0
Rhode Island	105,631	258	56,891	162,780	169,345	−3.9	349	99	252.5
South Carolina	187,900	112,486	33,125	333,511	308,807	8.0	----	----	----
Vermont	20,536	429	24,358	45,323	44,994	0.7	----	----	----
Virginia	236,226	29,381	94,921	360,528	428,037	−15.8	----	----	----
West Virginia	128,271	7,767	19,387	155,425	148,943	−4.4	250	76	228.9
Total 1962	5,403,990	679,688	1,540,303	7,623,981	----	9.3	11,976	----	−4.4
Total 1961	4,924,804	567,273	1,485,168	----	6,977,245	----	----	12,525	----
District 2:									
Illinois	992,341	44,587	154,125	1,191,053	1,120,710	6.3	224,617	197,880	13.5
Indiana	368,125	148,376	137,615	654,116	644,005	1.6	31,827	37,808	−15.8
Iowa	321,420	40,601	97,035	459,056	458,811	0.1	24,153	30,469	−20.7
Kansas	299,887	230	278,326	578,443	500,836	15.5	7,333	20,977	−65.1
Kentucky	175,874	66,476	84,089	326,439	287,391	13.6	11,669	11,486	1.6
Michigan	379,488	65,424	72,428	517,340	467,128	10.7	28,414	24,619	15.4
Minnesota	387,511	21,030	205,570	614,111	640,327	−4.1	29,592	35,711	−17.1
Missouri	397,894	8,549	287,361	693,804	700,582	−1.0	85,790	74,754	14.8
Nebraska	78,071	519	54,943	133,533	130,740	2.1	2,382	4,071	−41.5
North Dakota	50,581	39,399	55,005	144,985	160,971	−9.9	8,585	2,713	216.4
Ohio	768,871	155,819	331,515	1,256,205	1,139,897	10.2	19,969	16,359	22.1
Oklahoma	309,199	4,327	174,226	487,752	394,618	23.6	5,395	3,535	52.6
South Dakota	41,334	11,666	38,985	91,985	117,240	−21.6	13,808	27,770	−50.3
Tennessee	342,852	24,156	77,161	444,169	372,342	19.3	631	----	----
Wisconsin	203,507	10,985	100,270	314,762	320,670	−1.9	161,719	145,883	10.9
Total 1962	5,116,955	642,144	2,148,654	7,907,753	----	6.1	655,884	----	3.4
Total 1961	4,722,658	640,422	2,093,188	----	7,456,268	----	----	634,035	----

TABLE 78.—Shipments of petroleum-asphalts and road oil in the United States, 1961–62, by PAD districts and States—Continued

(Short tons)

District and State	Asphalts cements and fluxes	Emulsified asphalts	Cutback asphalts	Total 1962	Total 1961	Percent change	Road oil		Percent change
							1962	1961	
District 3:									
Alabama	297,563	71,843	70,634	440,040	413,064	6.5	19	17	11.8
Arkansas	137,024	23,528	59,667	220,219	199,079	10.6	299	------	------
Louisiana	356,309	37,770	22,152	416,231	362,961	14.7	1,952	868	124.9
Mississippi	140,774	12,318	29,439	182,531	175,908	3.8	------	------	------
New Mexico	119,199	8,381	56,867	184,447	188,264	−2.0	8,809	6,066	45.2
Texas	1,136,525	39,428	222,843	1,398,796	1,355,504	3.2	50,082	42,201	18.7
Total 1962	2,187,394	193,268	461,602	2,842,264	------	5.5	61,161	------	24.4
Total 1961	2,076,014	155,352	463,414	------	2,694,780	------	------	49,152	------
District 4:									
Colorado	210,986	148	72,732	283,866	284,576	−0.3	14,049	10,086	39.3
Idaho	92,004	8,368	41,356	141,728	83,690	69.3	21,155	11,188	89.1
Montana	86,376	6,602	51,827	144,805	152,273	−4.9	6,091	5,779	5.4
Utah	110,122	183	47,564	157,869	119,962	31.6	13,905	11,774	18.1
Wyoming	61,282	1,987	38,044	101,313	108,617	−6.7	17,753	15,206	16.7
Total 1962	560,770	17,288	251,523	829,581	------	10.7	72,953	------	35.0
Total 1961	477,427	15,987	255,704	------	749,118	------	------	54,033	------
District 5:									
Alaska	9,759	350	4,158	14,267	16,077	−11.3	------	4	------
Arizona	88,139	39,479	31,725	159,343	176,419	−9.7	6,724	5,154	30.5
California	1,711,195	127,497	110,756	1,949,448	1,895,627	2.8	270,332	300,778	−10.1
Hawaii	28,543	6,514	383	35,440	40,368	−12.2	------	------	------
Nevada	39,631	6,379	18,497	64,507	62,672	2.9	18,775	18,053	4.0
Oregon	315,010	18,311	44,366	377,687	377,506	------	9,691	3,526	174.8
Washington	190,544	8,763	92,680	291,987	262,292	11.3	1,563	6,076	−74.3
Total 1962	2,382,821	207,293	302,565	2,892,679	------	2.2	307,085	------	−8.0
Total 1961	2,281,316	206,933	342,712	------	2,830,961	------	------	333,591	------
United States Total 1962	15,651,930	1,739,681	4,704,647	22,096,258	------	6.7	1,109,059	------	2.4
United States Total 1961	14,482,219	1,585,967	4,640,186	------	20,708,372	------	------	1,083,336	------

OTHER PRODUCTS

Wax.—The demand for wax continued to decline in 1962. Total demand declined 4.1 percent to 5.4 million barrels, and domestic demand was 9.7 percent below the 1961 level. Posted prices on bulk lots of wax remained at the same level as a year ago.

Coke.—The total production of petroleum coke in 1962 was 78.7 million barrels of which 31.6 million was marketable. The other 60 percent was coke burned off catalytic cracking units and was utilized as refinery fuel.

The domestic demand for petroleum coke increased 5.3 percent in 1962, and exports were 2.5 percent higher. In addition to the catalyst coke, refineries used 4.2 million barrels of marketable coke as fuel in 1962. Coke with low sulphur content is used in making electrodes required in the electrolic production of aluminum.

Still gas.—The production of still gas in 1962 was 782,776 million cubic feet (130,829,000 barrels). Refiners used 769,069 million cubic feet, or 98.2 percent of the still gas production, as refinery fuel in 1962. The heating value of the gas in 1962 was 1,003 Btu per cubic foot compared with 989 Btu in 1961.

Miscellaneous Oils.—The demand for miscellaneous finished oils increased over 10 percent in 1962. Total demand was 31.3 million barrels, and domestic demand was 31.1 million barrels.

The total production of miscellaneous oils in 1962 increased 3.4 million barrels to 31.9 million barrels. About 51 percent of the increased production was in petrochemicals. Petroleum refineries produced 93.4 percent of the total production; natural-gas processing plants produced the remainder.

TABLE 79.—Salient statistics on wax in the United States, by types, months, and districts

(Thousand barrels)[1]

Month and district	1961											1962[2]									
	Production				Imports (all types)	Exports (all types)	Stocks end of period				Domestic demand (all types)	Production				Imports (all types)	Exports (all types)	Stocks end of period				Domestic demand (all types)
	Microcrystal line	Fully refined	Other	Total			Microcrystalline	Fully refined	Other	Total		Microcrystalline	Fully refined	Other	Total			Microcrystalline	Fully refined	Other	Total	
By months:																						
January	35	290	150	475	-------	99	151	339	391	881	400	50	234	146	430	-------	80	191	456	396	1,043	368
February	63	293	125	481	-------	108	155	417	322	894	360	34	233	126	393	-------	88	157	471	332	960	388
March	70	322	153	545	-------	124	176	449	305	930	385	77	297	116	490	-------	119	169	462	296	927	404
April	56	294	172	522	-------	103	184	486	335	1,005	344	64	238	125	427	-------	130	167	450	294	911	313
May	66	280	108	454	-------	105	194	485	311	990	364	76	271	152	499	-------	123	19	419	309	919	368
June	53	267	130	450	1	111	190	462	293	945	385	66	232	125	423	-------	160	153	424	286	863	319
July	43	249	206	498	-------	87	172	484	357	1,013	343	69	235	186	490	-------	119	181	410	395	986	248
August	72	255	169	496	-------	95	187	475	377	1,039	375	67	249	153	469	-------	144	198	416	373	987	324
September	48	280	132	460	-------	109	191	491	366	1,048	342	69	261	97	427	-------	126	202	435	349	986	302
October	61	269	114	444	-------	97	197	480	322	999	396	51	248	159	458	-------	102	194	406	378	978	364
November	63	269	161	493	-------	104	204	476	334	1,014	374	57	243	112	412	-------	124	201	397	353	951	315
December	56	253	154	463	1	95	234	470	357	1,061	322	62	241	132	435	-------	114	223	428	369	1,020	252
Total	686	3,321	1,774	5,781	2	1,237	234	470	357	1,061	4,390	742	2,982	1,629	5,353	-------	1,429	223	428	369	1,020	3,965

By districts:																					
East Coast	209	1,507	267	1,983	2	457	28	113	100	241	(3)	209	1,361	316	1,886	-------	1,246	31	79	35	145	(3)
Appalachian No. 1	7	52	187	246			15	46	26	87		14	47	222	283	-------		16	52	25	93	
Appalachian No. 2	------	47	20	67	------	77	-----	7	------	7		-----	50	29	79	-------		-----	7	------	7	
Indiana, Illinois, Kentucky, etc.	7	288	112	407			-----	15	43	58		14	232	119	365	-------		2	25	73	100	
Minnesota, Wisconsin, etc.	------	------	------	------			------	------	------	------		------	------	------	------	-------		------	------	------	------	
Oklahoma, Kansas, etc.	247	198	142	587			89	78	8	175		285	219	97	601	-------		78	80	6	164	
Texas Inland	70	------	------	70	------	578	23	------	------	23		70	------	------	70	-------		21	------	------	21	
Texas Gulf Coast	115	651	519	1,285			31	43	123	197		87	552	391	1,030	-------		34	52	123	209	
Louisiana Gulf Coast	26	19	510	555			44	6	35	85		32	20	453	505	-------		11	5	83	99	
Arkansas, Louisiana Inland, etc.	------	------	------	------			------	------	------	------		------	------	------	------	-------		------	------	------	------	
New Mexico	------	------	------	------			------	------	------	------		------	------	------	------	-------		------	------	------	------	
Rocky Mountain	5	51	17	73	-------	------	4	14	22	40		31	52	2	85	-------		30	9	24	63	
West Coast	------	508	------	508	-------	125	------	148	------	148		-----	449	------	449	-------	183	------	119	------	119	
Total	686	3,321	1,774	5,781	2	1,237	234	470	357	1,061	4,390	742	2,982	1,629	5,353	-------	1,429	223	428	369	1,020	3,965

---

[1] Conversion factor: 280 pounds to the barrel.
[2] Preliminary figures.
[3] Figures not available.

TABLE 80.—Average monthly refinery prices of 124°–126° white crude scale wax at Pennsylvania refineries

(Cents per pound)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average for year
1958	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1959	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1960	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.23	6.13	6.24
1961	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13
1962	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13	6.13

Source: Platt's Oil Price Handbook.

TABLE 81.—Salient statistics of petroleum coke in the United States, by months and districts[1]

(Thousand barrels, unless otherwise stated)

Month and district	1961							1962[2]						
	Production			Yield (percent)	Exports	Stocks, end of period	Domestic demand	Production			Yield (percent)	Exports	Stocks, end of period	Domestic demand
	Marketable	Catalyst	Total					Marketable	Catalyst	Total				
By months:														
January	2,387	3,915	6,302	2.4	571	4,665	5,453	2,800	3,797	6,597	2.5	453	5,312	6,148
February	2,151	3,456	5,607	2.3	427	4,663	5,182	2,388	3,704	6,092	2.5	855	5,265	5,284
March	2,437	3,750	6,187	2.5	679	5,126	5,045	2,676	4,016	6,692	2.6	479	5,356	6,122
April	2,657	3,581	6,238	2.7	508	5,508	5,348	2,250	3,602	5,852	2.4	535	5,153	5,520
May	2,463	3,627	6,090	2.4	626	5,611	5,361	2,714	3,973	6,687	2.6	703	5,072	6,065
June	2,448	3,733	6,181	2.6	658	5,553	5,581	2,838	4,121	6,959	2.7	865	5,059	6,107
July	2,641	3,983	6,624	2.6	792	5,676	5,709	2,537	4,157	6,694	2.5	767	5,240	5,746
August	2,683	4,029	6,712	2.5	641	5,560	6,187	2,727	4,120	6,847	2.6	567	5,052	6,468
September	2,513	3,403	5,916	2.4	624	5,474	5,378	2,606	3,905	6,511	2.5	689	5,219	5,655
October	2,695	3,763	6,458	2.5	661	5,405	5,866	2,791	3,826	6,617	2.5	439	5,186	6,211
November	2,714	3,634	6,348	2.6	501	5,341	5,911	2,552	3,783	6,335	2.5	554	5,398	5,569
December	2,691	3,979	6,670	2.5	582	5,316	6,113	2,745	4,096	6,841	2.6	548	5,880	5,811
Total	30,480	44,853	75,333	2.5	7,270	5,316	67,134	31,624	47,100	78,724	2.6	7,454	5,880	70,706
By districts:														
East Coast	5,876	7,353	13,229	2.9	242	1,698	(3)	5,506	7,470	12,976	2.9	4,719	1,639	(3)
Appalachian No. 1				.5		-------					.3		-------	
Appalachian No. 2	12,634	15,054	27,688	1.1	1,307	-------		12,196	14,568	26,764	1.3		-------	
Indiana, Illinois, Kentucky, etc				3.2		601					3.0		843	
Minnesota, Wisconsin, etc				3.9		236					3.7		36	
Oklahoma, Kansas, etc				3.2		196					3.1		266	
Texas Inland	4,355	17,613	21,968	1.6	2,675	82		5,691	20,086	25,777	1.7		-------	
Texas Gulf Coast				2.0		28					2.3		57	
Louisiana Gulf Coast				1.9		36					1.9		27	
Arkansas, Louisiana Inland, etc				4.9		615					4.9		523	
New Mexico				.5		-------					.6		-------	
Rocky Mountain	603	1,958	2,561	2.5	-------	950		609	2,095	2,704	2.4		1,241	
West Coast	7,012	2,875	9,887	2.2	3,046	874		7,622	2,881	10,503	2.2	2,735	1,248	
Total	30,480	44,853	75,333	2.5	7,270	5,316	67,134	31,624	47,100	78,724	2.6	7,454	5,880	70,706

---

[1] Conversion factor: 5.0 barrels to the short ton.
[2] Preliminary figures.
[3] Figures not available.

TABLE 82.—Production of still gas in the United States by districts

District	1960		1961		1962[1]	
	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels	Million cubic feet	Equivalent in thousand barrels
East Coast	95,297	16,159	91,911	15,908	92,733	15,922
Appalachian No. 1	10,001	1,763	9,269	1,665	11,524	1,837
Appalachian No. 2	11,494	2,050	12,658	1,909	12,450	1,829
Indiana, Illinois, Kentucky, etc	158,043	26,380	162,774	26,984	157,965	26,308
Minnesota, Wisconsin, North Dakota, and South Dakota	9,224	1,531	9,156	1,513	9,272	1,554
Oklahoma, Kansas, etc	66,949	10,959	63,787	10,632	67,163	10,831
Texas Inland	32,434	5,643	31,093	5,194	25,354	4,733
Texas Gulf Coast	176,309	26,113	165,358	23,681	176,709	26,118
Louisiana Gulf Coast	52,753	7,528	54,777	7,675	60,720	9,131
Arkansas, Louisiana Inland, etc	11,856	2,259	11,119	2,062	11,296	2,080
New Mexico	1,266	223	1,260	242	1,525	284
Rocky Mountain	22,308	4,139	20,774	4,039	20,609	4,047
West Coast	131,479	24,733	139,479	26,033	135,456	26,155
Total	779,413	129,480	773,415	127,537	782,776	130,829

[1] Preliminary figures.

TABLE 83.—Production of miscellaneous finished oils in the United States in 1962, by districts and classes

(Thousand barrels)

District	Absorption	Petrolatum	Specialty oils			Petrochemicals			All other products	Total
			Medicinal	Spray oils	Other	Plasticizers	Polymers	Other		
East Coast	------	------	86	6	647	5	------	2,839	364	3,947
Appalachian No. 1	53	72	11	------	24	1	------	514	------	675
Appalachian No. 2	------	------	------	38	------	------	------	14	------	52
Indiana, Illinois, Kentucky, etc	------	48	------	264	539	110	------	2,543	477	3,981
Minnesota, Wisconsin, North Dakota, and South Dakota	------	------	------	------	------	------	------	66	------	66
Oklahoma, Kansas, etc	41	417	------	------	141	29	100	918	210	1,856
Texas Inland	379	------	------	------	43	------	121	694	------	1,237
Texas Gulf Coast	79	516	------	21	218	------	937	3,657	2,070	7,498
Louisiana Gulf Coast	964	42	------	------	15	------	67	2,718	2,705	6,511
Arkansas, Louisiana Inland	538	------	------	------	------	------	128	14	37	717
Rocky Mountain and New Mexico	104	------	------	------	6	------	------	1	151	262
West Coast	23	28	51	77	437	173	------	1,326	2,966	5,081
Total: 1962	2,181	1,123	148	406	2,070	318	1,353	15,304	8,980	31,883
1961	2,317	1,074	147	362	1,642	180	1,515	13,561	7,714	28,512

Unfinished Oils.—Unfinished oils include all oils that will be cracked or further distilled. Unfinished gasoline, formerly included in the statistics on gasoline is now included with unfinished oils. The rerun (net) of unfinished oils represents the imports plus or minus the change in stocks.

Imports of unfinished oils are included with crude oil under the quota established by the Oil Import Administration. By regulation unfinished imports are restricted to 10 percent of the crude oil and unfinished oils quota. Imports in 1962 were 32,516,000 barrels.

INTERCOASTAL SHIPMENTS

Intercoastal shipments of petroleum declined 1.4 percent in 1962 because of a decline of 13.3 million barrels in shipments from the Gulf to the east coast. West to east coast shipments increased 1.2 million barrels, and gulf coast to west coast shipments increased 1.9 million barrels for the year.

In the gulf-to-east-coast movement for 1962, crude oil shipments declined 16.0 million barrels, residual fuel oil 7.8 million barrels, while distillate fuel oil shipments increased 6.8 million barrels and kerosine, 4.9 million barrels.

Gulf-to-the-west-coast shipments were bolstered by the increase in gasoline shipments during the middle of the year to build up low stocks on the west coast.

TABLE 84.—Petroleum oils, crude and refined, shipped commercially from gulf and west coasts to east coast ports and from the gulf coast to west coast ports, by classes, 1962 by months and year 1961

(Thousand barrels)

Item	1962													1961 total
	January	February	March	April	May	June	July	August	September	October	November	December	Total	
Gulf Coast to East Coast:[1]														
Crude oil	17,725	13,670	16,389	16,850	12,010	11,561	11,578	11,271	12,037	11,833	11,753	12,842	159,519	175,481
Gasoline	20,360	15,917	21,863	21,678	22,212	21,127	21,084	20,182	20,818	19,350	17,519	19,193	241,303	241,860
Kerosine	5,053	3,932	3,137	2,869	3,741	3,253	4,206	3,958	4,153	4,577	4,431	5,540	48,850	44,365
Distillate fuel oil	23,981	18,515	16,449	15,160	13,267	15,343	13,945	14,206	13,027	15,392	15,572	20,958	195,815	189,001
Residual fuel oil	3,642	3,101	4,223	3,259	3,741	3,645	3,091	2,656	2,958	2,891	3,387	2,750	39,344	47,135
Lubricating oils	536	613	638	902	1,067	725	872	710	697	727	622	500	8,609	7,962
Other products	1,382	817	698	942	1,015	1,213	1,293	870	915	1,339	1,072	1,227	12,783	13,674
Total	72,679	56,565	63,397	61,660	57,053	56,867	56,069	53,853	54,605	56,109	54,356	63,010	706,223	719,478
West Coast to East Coast:														
Crude oil	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Gasoline	----	----	----	----	----	----	----	----	----	----	----	----	----	254
Distillate fuel oil	225	326	460	----	109	321	295	429	515	379	244	240	3,543	2,114
Residual fuel oil	252	517	257	----	210	330	199	373	291	873	1,311	----	4,613	4,702
Lubricating oils	53	74	9	71	68	1	53	45	----	80	----	71	525	528
Other products	9	93	5	152	----	160	81	54	64	152	----	100	870	745
Total	539	1,010	731	223	387	812	628	901	870	1,484	1,555	411	9,551	8,343
Gulf Coast to West Coast:[1]														
Crude oil	136	----	----	----	136	----	136	133	----	----	----	----	541	650
Gasoline	34	219	32	226	430	303	552	223	330	252	5	5	2,611	1,112
Kerosine	30	----	----	106	----	----	----	----	----	----	----	----	136	290
Military jet fuel	----	----	----	126	----	159	----	----	----	----	----	----	285	----
Unfinished oils	----	----	----	39	----	----	----	----	----	----	----	----	39	----
Lubricating oils	84	10	228	145	110	106	89	126	133	70	147	89	1,337	1,038
Other products	3	----	6	----	----	----	----	3	----	4	3	11	30	35
Total	287	229	266	642	676	568	777	485	463	326	155	105	4,979	3,125

[1] Source: Geological Survey, U.S. Department of the Interior.

FOREIGN TRADE

Foreign trade statistics in this section, as reported by the U.S. Department of Commerce, differ slightly from those used in other sections of this chapter. Imports of crude petroleum and unfinished oils (see table 85) are obtained from petroleum refining companies to be consistent with the refinery balance; therefore, they may differ from the totals reported by the U.S. Department of Commerce. The Bureau of Mines import data exclude all imports from foreign sources to U.S. territories and possessions and include as exports all petroleum shipments to these territories and possessions from the United States.

Imports.—According to U.S. Department of Commerce data, imports into the United States, including territories and possessions, were 782.9 million barrels, 65.8 million barrels higher than in 1961. Imports from South American countries increased 40.8 million barrels, from other North American countries 28.4 million barrels, from Africa 7.8 million, while receipts from Asian countries declined 11.8 million barrels. Crude petroleum represented 55.1 percent of the total net imports to the United States and residual fuel oil 36.3 percent.

Exports.—Total exports of crude oil and refined products in 1962 were 61.2 million barrels, compared with 62.4 million barrels in 1961. Exports of crude oil were 1.4 million barrels less than in 1961. Exports of gasoline and residual fuel oil declined 3.4 million barrels but were offset by gains in distillate fuel oil and the other refined products.

TABLE 85.—Petroleum oils, crude and refined, imported into the United States, by months [1]

(Thousand barrels)

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1961:													
Crude petroleum	33,688	28,768	33,276	26,969	33,566	27,186	37,975	34,048	33,147	33,585	30,119	29,221	381,548
Refined products:													
Gasoline	1,038	484	975	609	1,239	603	1,194	440	1,103	732	908	1,360	10,685
Kerosine	80	118	186	174	321	292	298	309	338	281	269	298	2,964
Distillate fuel oil	2,208	1,037	1,484	1,137	794	1,101	1,637	1,210	1,502	1,279	1,458	2,530	17,377
Residual fuel oil	28,000	26,449	23,826	23,633	17,556	13,152	17,794	13,691	15,510	17,315	21,592	24,750	243,268
Military jet fuel	181	832	542	785	2,095	1,262	150	1,045	1,720	636	294	503	10,045
Lubricants	1	1	2	----------	2	1	2	----------	1	2	1	1	14
Wax	----------	----------	----------	----------	----------	1	----------	----------	----------	----------	----------	1	2
Asphalt	333	257	301	439	645	1,020	790	738	675	549	538	324	6,609
Liquefied gases (including ethane	166	116	159	159	212	152	112	92	102	213	152	171	1,806
Unfinished oils	1,757	1,465	1,685	1,957	2,071	2,415	3,546	2,313	1,801	2,468	2,018	1,852	25,348
Total refined	33,764	30,759	29,160	28,893	24,935	19,999	25,523	19,838	22,752	23,475	27,230	31,790	318,118
Total crude and refined	67,452	59,527	62,436	55,862	58,501	47,185	63,498	53,886	55,899	57,060	57,349	61,011	699,666
1962: [2]													
Crude petroleum	36,349	31,603	31,761	32,249	34,181	33,817	35,936	40,293	34,407	35,828	33,266	31,349	411,039
Refined products:													
Gasoline	444	865	829	992	1,029	1,438	987	1,355	1,561	1,501	1,284	1,685	13,970
Kerosine	454	164	284	455	578	565	730	606	669	754	487	523	6,269
Distillate fuel oil	2,314	644	685	1,514	1,457	986	732	453	1,015	690	533	462	11,485
Residual fuel oil	31,007	22,910	27,506	20,419	18,156	16,765	16,954	16,330	17,846	19,344	26,508	30,158	263,903
Military jet fuel	1,702	147	1,164	479	526	1,274	171	1,004	2,535	475	513	907	10,897
Lubricants	1	1	1	2	1	1	1	1	4	9	4	2	28
Wax	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Asphalt	380	483	367	228	608	882	748	531	672	768	540	430	6,637
Liquefied gases (including ethane)	218	205	287	146	64	118	130	117	149	291	266	257	2,248
Unfinished oils	2,739	2,497	2,732	2,675	2,639	2,697	2,379	4,134	2,717	3,052	1,443	2,812	32,516
Total refined	39,259	27,916	33,855	26,910	25,058	24,726	22,832	24,531	27,168	26,884	31,578	37,236	347,953
Total crude and refined	75,608	59,519	65,616	59,159	59,239	58,543	58,768	64,824	61,575	62,712	64,844	68,585	758,992

[1] Imports of crude reported to the Bureau of Mines; imports of refined products compiled from records of the U.S. Department of Commerce.
[2] Preliminary figures.

TABLE 86.—Crude petroleum and petroleum products imported for consumption into the United States, 1961–62, by country [1]

(Thousand barrels)

Country	Crude petroleum [2]	Gasoline [3]	Kerosine [4]	Distillate oil [2] [5]	Residual oil [3] [5]	Asphalt	Unfinished oil [6]	Miscellaneous oils [2]	Total
1961:									
North America:									
Canada	65,819	2,397	1	302	788	(7)	53	4	69,364
Mexico	6,835	--------	--------	--------	[8] 6,249	--------	1,481	(7)	[8] 14,565
Netherlands Antilles	2,165	[8] 6,949	420	[8] 6,138	[8] 90,000	4,082	6,006	(7)	[8] 115,760
Trinidad and Tobago	172	4,019	--------	198	[8] 22,159	6	2,272	--------	[8] 28,826
Other North America	--------	--------	--------	(9)	[8] 884	--------	--------	--------	[8] 884
Total	74,991	[8] 13,365	421	[8] 6,638	[8] 120,080	4,088	9,812	4	[8] 229,399
South America:									
Brazil	1,776	--------	--------	--------	619	--------	--------	--------	2,395
Colombia	10,069	--------	--------	--------	251	--------	--------	--------	10,320
Venezuela	180,387	[8] 3,683	4	[8] 8,107	[8] 115,700	2,639	10,207	(7)	[8] 320,727
Other South America	8	--------	--------	--------	--------	1	--------	--------	9
Total	192,240	[8] 3,683	4	[8] 8,107	[8] 116,570	2,640	10,207	(7)	[8] 333,451
Europe:									
Italy	--------	--------	--------	--------	[8] 4	--------	110	--------	[8] 114
United Kingdom	--------	(7)	--------	(7)	17	--------	160	6	183
Other Europe	--------	55	--------	--------	635	--------	--------	10	700
Total	--------	55	--------	(7)	[8] 656	--------	270	16	[8] 997
Asia:									
Bahrein	--------	--------	--------	--------	385	--------	--------	--------	385
Indonesia	22,780	--------	--------	--------	--------	--------	--------	--------	22,780
Iran	22,203	--------	--------	--------	--------	--------	--------	--------	22,203
Iraq	9,297	--------	--------	--------	--------	--------	--------	--------	9,297
Japan	--------	35	--------	--------	170	--------	2,044	--------	2,249
Kuwait	51,366	(7)	--------	--------	2	--------	3,331	--------	54,699
Qatar [10]	12,999	--------	--------	--------	70	--------	128	--------	13,197
Saudi Arabia	24,211	188	--------	--------	2,081	--------	10	--------	26,490
Other Asia	295	12	--------	--------	86	--------	--------	--------	393
Total	143,151	235	--------	--------	2,794	--------	5,513	--------	151,693
Africa:									
Libya	(7)	--------	--------	--------	--------	--------	--------	--------	(7)
United Arab Republic (Egypt)	1,586	--------	--------	--------	--------	--------	--------	--------	1,586
Other Africa	--------	--------	--------	3	6	--------	--------	--------	9
Total	1,586	--------	--------	3	6	--------	--------	--------	1,595
Oceania	--------	16	--------	--------	--------	--------	--------	--------	16
Grand total	411,968	[8] 17,354	425	[8] 14,748	[8] 240,106	6,728	25,802	20	[8] 717,151
Shipments from noncontiguous Territories to the United States: Puerto Rico [11]	--------	8,444	--------	2,629	4,834	--------	--------	--------	15,907
Imports into noncontiguous Territories from foreign countries: Puerto Rico	24,962	704	--------	2	1,341	101	7,292	--------	34,402
Total net imports into the United States	387,006	[8] 25,094	425	[8] 17,375	[8] 243,599	6,627	18,510	20	[8] 698,565
1962:									
North America:									
Canada	84,923	3,156	(7)	2,119		11	128	12	90,349
Mexico	7,057	--------	--------	7,484		--------	3,417	--------	17,958
Netherlands Antilles	2,342	14,684	(7)	94,046		3,369	2,533	(7)	116,974

See footnotes at end of table.

TABLE 86.—Crude petroleum and petroleum products imported for consumption into the United States, 1961–62, by country [1]—Continued

(Thousand barrels)

Country	Crude petroleum [2]	Gasoline [3]	Kerosine [4]	Distillate oil [2] [5]	Residual oil [2] [5]	Asphalt	Unfinished oil [6]	Miscellaneous oils [2]	Total
1962									
North America—Con.									
Trinidad and Tobago	25	2,457	(7)	25,969		32	2,131	--------	30,614
Other North America	--------	286	--------	1,610		--------	--------	--------	1,896
Total	94,347	20,583	(7)	131,228		3,412	8,209	12	257,791
South America:									
Brazil	1,449	--------	--------	484		--------	--------	--------	1,933
Colombia	8,648	--------	3	314		--------	--------	--------	8,965
Venezuela	203,313	12,516	--------	136,228		3,192	7,715	--------	362,964
Other South America	216	--------	--------	174		(7)	--------	--------	390
Total	213,626	12,516	3	137,200		3,192	7,715	--------	374.252
Europe:									
Italy	--------	26	--------	109		--------	127	--------	262
United Kingdom	--------	40	--------	273		--------	132	6	451
Other Europe	--------	40	(7)	117		94	559	12	822
Total	--------	106	(7)	499		94	818	18	1,535
Asia:									
Bahrein	60	--------	--------	128		--------	--------	--------	188
Inodesia	24,345	--------	--------	--------		--------	--------	--------	24,345
Iran	18,963	--------	--------	--------		--------	--------	--------	18,963
Iraq	837	--------	--------	--------		--------	--------	--------	837
Japan	--------	96	--------	1		--------	1,251	--------	1,348
Kuwait	43,825	--------	--------	182		--------	2,824	--------	46,831
Qatar [10]	11,987	61	--------	260		--------	--------	--------	12,308
Saudi Arabia	32,296	--------	--------	1,654		--------	300	--------	34,250
Other Asia	435	7	--------	--------		--------	410	(7)	852
Total	132,748	164	--------	2,225		--------	4,785	(7)	139,922
Africa:									
Libya	6,165	--------	--------	--------		--------	--------	--------	6,165
United Arab Republic (Egypt)	1,534	--------	--------	--------		--------	--------	--------	1,534
Other Africa	1,737	--------	--------	7		--------	--------	--------	1,744
Total	9,436	--------	--------	7		--------	--------	--------	9,443
Grand total	450,157	33,369	3	271,159		6,698	21,527	30	782,943
Shipments from noncontiguous Territories to the United States: Puerto Rico [11]	--------	8,458	--------	6,362		--------	--------	--------	14,820
Imports into noncontiguous Territories from foreign countries: Puerto Rico	30,400	3,937	--------	1,211		72	779	(7)	36,399
Total net imports into the United States	419,757	37,890	3	276,310		6,626	20,748	30	761,364

---

[1] Compiled by Mae B. Price and Elsie D. Jackson of the Bureau of Mines from records of the Bureau of the Census, U.S. Department of Commerce.

[2] Includes some quantities imported free for supplies of vessels and aircraft.

[3] Includes jet fuel, liquefied gases and naphtha, but excludes benzol (1961: 460,839; 1962: 547,537 barrels).

[4] Includes quantities imported free for supplies of vessels and aircraft; assumed to be commercial jet fuel by Bureau of Mines.

[5] Effective July 1, 1962; distillate and residual fuel oil not separately classified.

[6] Due to changes in classification effective July 1, 1962; data not strictly comparable to earlier years.

[7] Less than 1,000 barrels.

[8] Revised figure.

[9] Revised to none.

[10] Assumed source; classified in import statistics under "Arabia Peninsular States, n.e.c."

[11] As reported to Bureau of Mines by shipping companies.

Source: Bureau of the Census.

TABLE 87.—Petroleum oils, crude and refined, shipped from the United States, including shipments to Territories and possessions, by classes and months[1]

Year and class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1961:													
Crude petroleum	135	295	339	316	229	435	178	309	130	190	400	271	3, 227
Refined products:													
Gasoline [2]	1, 068	412	629	1, 196	495	1, 140	620	823	838	580	876	299	8, 976
Kerosine	42	20	28	19	20	15	3	26	11	16	15	16	231
Distillate fuel oil	728	300	458	556	811	699	591	352	341	750	602	743	6, 931
Residual fuel oil	1, 176	1, 014	1, 322	1, 253	1, 615	1, 125	805	1, 398	880	1, 194	954	1, 286	14, 022
Military jet fuel	2	6	16	24	----------	15	1	30	1	26	1	----------	122
Lubricants	1, 048	1, 555	1, 595	1, 365	1, 552	1, 318	1, 534	1, 718	1, 263	1, 396	1, 520	1, 230	17, 094
Wax	99	108	124	103	105	111	87	95	109	97	104	95	1, 237
Coke	571	427	679	508	626	658	792	641	624	661	501	582	7, 270
Asphalt	27	40	76	37	85	36	54	40	40	79	56	97	667
Liquefied gases (including ethane)	282	298	296	219	313	263	261	338	308	333	327	303	3, 541
Miscellaneous oils	23	23	22	18	21	19	22	22	19	15	21	20	245
Total refined	5, 066	4, 203	5, 245	5, 298	5, 643	5, 399	4, 770	5, 483	4, 434	5, 147	4, 977	4, 671	60, 336
Total crude and refined	5, 201	4, 498	5, 584	5, 614	5, 872	5, 834	4, 948	5, 792	4, 564	5, 337	5, 377	4, 942	63, 563
1962: [3]													
Crude petroleum	99	137	215	87	340	42	190	184	95	3	249	145	1, 786
Refined products:													
Gasoline [2]	381	404	147	645	329	644	643	773	777	804	399	508	6, 454
Kerosine	17	11	15	20	15	15	38	66	33	41	24	41	336
Distillate fuel oil	827	721	870	461	441	342	424	543	869	535	987	1, 178	8, 198
Residual fuel oil	1, 213	1, 604	1, 388	1, 011	1, 472	820	1, 010	1, 053	837	618	939	905	12, 870
Military jet fuel	----------	----------	1	1	1	1	----------	----------	34	10	10	24	82
Lubricants	1, 340	946	1, 157	1, 800	1, 653	1, 547	1, 631	1, 532	1, 855	1, 019	1, 404	1, 818	17, 702
Wax	80	88	119	130	123	160	119	144	126	102	124	114	1, 429
Coke	453	855	479	535	703	865	767	567	689	439	554	548	7, 454
Asphalt	71	95	60	61	132	91	78	56	53	77	50	51	875
Liquefied gases (including ethane)	310	249	330	247	315	295	314	417	367	342	310	378	3, 874
Miscellaneous oils	14	18	23	21	14	23	20	27	18	14	20	25	237
Total refined	4, 706	4, 991	4, 589	4, 932	5, 198	4, 803	5, 044	5, 178	5, 658	4, 001	4, 821	5, 590	59, 511
Total crude and refined	4, 805	5, 128	4, 804	5, 019	5, 538	4, 845	5, 234	5, 362	5, 753	4, 004	5, 070	5, 735	61, 297

---

[1] Compiled from records of U.S. Department of Commerce.
[2] Includes benzol, naphtha, natural gasoline, and antiknock compounds.
[3] Preliminary figures.

TABLE 88.—Crude petroleum and petroleum products exported from the United States by countries of destination, and shipments to and exports from Territories and possessions [1]

(Thousand barrels)

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil	Residual oil	Lubricating oil	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products	Total
1961:													
North America:													
Canada	20	1,072	57	998	2,997	1,376	52	99	148	1,515	13	54	8,401
El Salvador	--------	7	--------	--------	--------	23	2	1	6	--------	1	2	42
Mexico	133	395	2	151	430	209	123	2,902	164	2	12	25	4,548
Netherlands Antilles	--------	2,930	--------	--------	--------	15	(3)	(3)	1	--------	1	(3)	2,947
Other North America	--------	69	11	82	33	325	30	90	67	--------	8	17	732
Total	153	4,473	70	1,231	3,460	1,948	207	3,092	386	1,517	35	98	16,670
South America:													
Argentina	--------	(3)	--------	(3)	4	52	2	346	2	--------	(3)	1	407
Brazil	--------	27	6	16	--------	1,155	1	11	52	61	7	1	1,337
Chile	--------	(3)	1	--------	11	216	[4] 57	--------	27	(3)	1	13	[4] 326
Colombia	1	15	(3)	(3)	--------	222	1	(3)	137	--------	4	8	388
Peru	--------	1	--------	--------	--------	131	1	--------	15	--------	1	8	157
Venezuela	--------	181	1	--------	--------	134	5	1	22	1	5	2	352
Other South America	--------	17	(3)	(3)	--------	115	2	--------	32	--------	1	10	177
Total	1	241	8	16	15	2,025	[4] 69	358	287	62	19	43	[4] 3,144
Europe:													
Belgium-Luxembourg	--------	128	1	--------	--------	918	1	(3)	16	344	3	7	1,418
Denmark	--------	8	--------	75	3	187	(3)	1	9	1	1	2	287
France	355	619	(3)	1	83	52	3	4	45	272	6	2	1,442
Germany, West	--------	78	10	1	(3)	407	(3)	13	98	324	9	2	942
Greece	--------	149	--------	--------	48	104	(3)	--------	1	--------	(3)	2	304
Italy	--------	259	1	--------	103	669	7	10	46	598	6	7	1,706
Netherlands	--------	284	2	--------	416	467	1	3	47	261	7	8	1,496
Norway	--------	1	(3)	(3)	--------	60	(3)	(3)	2	592	2	4	661
Sweden	--------	32	--------	--------	--------	419	1	(3)	14	40	2	12	520
United Kingdom	437	456	68	173	914	[4] 1,427	5	37	90	69	27	2	[4] 3,705
Other Europe	--------	30	(3)	(3)	5	584	9	(3)	50	285	9	8	980
Total	792	2,044	82	250	1,572	[4] 5,294	27	68	418	2,786	72	56	[4] 13,461

Asia:													
India	-------	61	1	-------	-------	1,014	7	(3)	2	79	15	6	1,185
Indonesia	-------	369	-------	-------	-------	324	1	(3)	2	1	11	11	719
Japan-Nansei and Nanpo Islands	2,218	403	2	5,130	8,800	2,037	9	16	27	2,689	31	111	21,473
Malaya and Singapore	-------	2	-------	1	-------	90	-------	-------	2	-------	4	2	101
Philippines	-------	36	(3)	4	-------	464	6	-------	14	-------	10	16	550
Turkey	-------	136	-------	-------	-------	361	(3)	-------	2	1	(3)	26	526
Other Asia	55	92	10	66	1	1,115	20	(3)	57	37	16	55	1,524
Total	2,273	1,099	13	5,201	8,801	5,405	43	16	106	2,807	87	227	26,078
Africa:													
Congo, Republic of the, and Ruanda-Urundi	-------	4	2	-------	-------	60	7	-------	-------	-------	(3)	1	74
Union of South Africa	-------	88	(3)	-------	1	489	112	-------	22	-------	14	20	746
United Arab Republic (Egypt)	-------	5	-------	-------	3	215	(3)	-------	(3)	-------	1	5	229
Western Africa, n.e.c.	-------	24	(3)	13	35	13	1	-------	-------	-------	1	1	88
Other Africa	-------	117	5	2	-------	232	58	5	7	99	7	17	549
Total	-------	238	7	15	39	1,009	178	5	29	99	23	44	1,686
Oceania:													
Australia	-------	37	3	10	129	747	1	2	9	-------	6	2	946
French Pacific Islands	-------	56	24	113	7	4	(3)	4	(3)	-------	-------	6	214
New Zealand	-------	21	2	(3)	-------	172	1	3	3	(3)	4	(3)	206
Other Oceania	-------	(3)	1	2	-------	1	9	1	-------	-------	-------	(3)	14
Total	-------	114	30	125	136	924	11	10	12	(3)	10	8	1,380
Grand total	3,219	8,209	210	6,838	14,023	[4]16,605	[4]535	3,549	1,238	7,271	246	476	[4]62,419
Shipments from the United States to Territories and possessions:													
Puerto Rico	-------	5	(3)	(3)	(5)	115	147	(5)	(5)	(5)	(5)	7	274
Virgin Islands	-------	49	17	51	(5)	4	5	(5)	(5)	(5)	(5)	(3)	126
Wake	-------	699	(3)	19	(5)	(3)	(3)	(5)	(5)	(5)	(5)	(3)	718
Other	-------	23	5	25	(5)	5	4	(5)	(5)	(5)	(5)	(3)	62
Total	-------	776	22	95	(5)	124	156	(5)	(5)	(5)	(5)	7	1,180
Exports from Territories to foreign countries: Puerto Rico	-------	2	(3)	3	2	(3)	(3)	8	-------	-------	(3)	(3)	15
Total net shipments from the United States	3,219	8,983	232	6,930	14,021	[4]16,729	[4]691	3,541	1,238	7,271	246	483	[4]63,584
1962:													
North America:													
Canada	8	947	47	574	2,788	1,357	81	87	135	1,620	14	56	7,714
El Salvador	-------	6	-------	-------	-------	25	1	(3)	9	-------	(3)	(3)	41
Mexico	(3)	207	20	77	559	155	194	3,546	152	6	10	55	4,981
Netherlands Antilles	-------	2,059	-------	-------	1	16	9	(3)	(3)	-------	1	2	2,088
Other North America	-------	66	6	102	15	362	40	63	82	(3)	8	15	759
Total	8	3,285	73	753	3,363	1,915	325	3,696	378	1,626	33	128	15,583

See footnotes at end of table.

TABLE 88.—Crude petroleum and petroleum products exported from the United States by countries of destination, and shipments to and exports from Territories and possessions [1]—Continued

(Thousand barrels)

Country	Crude petroleum	Gasoline [2]	Kerosine	Distillate oil	Residual oil	Lubricating oil	Asphalt	Liquefied petroleum gases	Wax	Coke	Petrolatum	Miscellaneous products	Total
South America:													
Argentina	--------	(3)	--------	--------	111	84	3	84	1	--------	(3)	1	284
Brazil	--------	58	8	(3)	--------	1,448	1	(3)	89	35	9	1	1,649
Chile	--------	(3)	2	10	--------	147	88	2	49	--------	1	9	308
Colombia	--------	12	(3)	--------	11	233	2	1	105	--------	3	10	377
Peru	--------	4	--------	--------	--------	159	--------	--------	25	--------	1	9	198
Venezuela	--------	192	(3)	--------	(3)	109	8	2	35	(3)	4	1	351
Other South America	--------	3	(3)	--------	31	151	12	1	42	--------	1	9	250
Total	--------	269	10	10	153	2,331	114	90	346	35	19	40	3,417
Europe:													
Belgium-Luxembourg	--------	5	1	--------	(3)	952	2	(3)	15	191	4	12	1,182
Denmark	--------	(3)	--------	103	--------	198	(3)	1	13	(3)	(3)	3	318
France	--------	170	1	3	384	61	3	3	53	285	4	2	969
Germany, West	--------	80	15	126	(3)	472	(3)	32	147	606	10	4	1,492
Greece	--------	109	--------	--------	(3)	106	1	--------	2	--------	(3)	2	220
Italy	--------	219	1	--------	377	632	7	12	53	677	7	9	1,994
Netherlands	--------	70	2	419	278	385	5	3	54	442	3	10	1,671
Norway	--------	1	--------	--------	1	34	1	--------	2	576	1	4	620
Sweden	--------	4	--------	507	--------	366	1	(3)	9	41	1	13	942
United Kingdom	428	542	28	104	502	1,249	2	8	84	77	19	1	3,044
Other Europe	--------	31	2	(3)	2	521	10	2	50	247	9	9	883
Total	428	1,231	50	1,262	1,544	4,976	32	61	482	3,142	58	69	13,335
Asia:													
India	--------	40	1	11	--------	1,392	6	--------	2	134	11	7	1,604
Indonesia	--------	1	--------	(3)	--------	288	37	--------	6	--------	27	2	361
Japan-Nansei and Nanpo Islands	--------	174	5	6,408	7,500	1,790	17	9	42	2,339	26	23	19,690
Malaya, Federation of, and Singapore	--------	151	--------	(3)	--------	203	(3)	--------	(3)	--------	2	11	367
Philippines	--------	7	(3)	(3)	--------	370	5	--------	14	--------	10	20	426
Turkey	--------	115	2	--------	--------	425	1	--------	(3)	--------	(3)	31	574
Other Asia	(3)	60	(3)	--------	--------	1,332	26	(3)	59	35	11	47	1,570
Total	1,357	548	8	6,419	7,500	5,800	92	9	123	2,508	87	141	24,592

Africa:													
Congo, Republic of the, and Ruanda-Urundi	--------	383	128	308	--------	123	21	--------	(3)	(3)	1	43	1,007
South Africa, Republic of	--------	157	(3)	(3)	1	531	89	(3)	34	--------	17	17	846
United Arab Republic (Egypt)	--------	4	(3)	--------	--------	226	--------	--------	(3)	--------	(3)	5	235
Western Africa, n.e.c.	--------	4	(3)	--------	--------	16	1	--------	--------	--------	(3)	1	22
Other Africa	--------	6	8	--------	--------	392	37	8	24	32	10	28	545
Total	--------	554	136	308	1	1,288	148	8	58	32	28	94	2,655
Oceania:													
Australia	--------	26	8	10	260	747	5	1	32	113	10	4	1,216
French Pacific Islands	--------	66	23	151	28	3	(3)	5	(3)	--------	--------	(3)	276
New Zealand	--------	8	3	--------	--------	105	1	3	11	--------	3	(3)	134
Other Oceania	--------	--------	1	5	3	(3)	--------	2	--------	--------	--------	(3)	11
Total	--------	100	35	166	291	855	6	11	43	113	13	4	1,637
Grand total	1,793	5,987	312	8,918	12,852	17,165	717	3,875	1,430	7,456	238	476	61,219
Shipments from the United States to Territories and possessions:													
Puerto Rico	--------	5	(3)	--------	(5)	115	88	(5)	(5)	(5)	(5)	6	214
Virgin Islands	--------	44	21	48	(5)	4	13	(5)	(5)	(5)	(5)	(3)	130
Wake	--------	505	(3)	22	(5)	(3)	1	(5)	(5)	(5)	(5)	(3)	528
Other	--------	97	4	65	(5)	4	8	(5)	(5)	(5)	(5)	(3)	178
Total	--------	651	25	135	(5)	123	110	(5)	(5)	(5)	(5)	6	1,050
Exports from Territories to foreign countries: Puerto Rico	--------	(3)	--------	829	3	(3)	4	3	--------	--------	--------	--------	839
Total net shipments from the United States	1,793	6,638	337	8,224	12,849	17,288	823	3,872	1,430	7,456	238	482	61,430

---

[1] Compiled by Mae B. Price and Elsie D. Jackson of the Bureau of Mines from records of the Bureau of the Census.
[2] Includes naphtha but excludes benzol: 1961—1,106,000 barrels; 1962—982,361 barrels.
[3] Less than 1,000 barrels.
[4] Revised figure.
[5] Not separately classified.

Source: Bureau of the Census.

WORLD SUPPLY AND DEMAND

PETROLEUM[5]

World production of 8,879 million barrels of crude petroleum in 1962 exceeded the 1961 level by 693 million barrels. This was an alltime high and the largest annual increase in the history of the industry. World demand for oil products also increased significantly during 1962. At year-end, however, the international oil industry was still burdened by excess producing capacity, and in world markets it was faced with steadily increasing competition and depressed prices.

Within the free world, crude output reached 7,360 million barrels, an increase of 541 million barrels. Most of this expansion was in the Eastern Hemisphere. Middle East output, representing one-quarter of the world total, increased 201 million barrels, with significant gains reported in Kuwait, Iran, and Saudi Arabia. Neutral-Zone output reflected the growing offshore activity of the Japanese-owned Arabian Oil Company. Elsewhere in the Persian Gulf, offshore production was initiated in the Trucial Coast Sheikdom of Abu Dhabi. Iraqi production, depressed by the political situation, remained at about the 1961 level. On the continent of Africa, crude production increased 116 million barrels in 1962 and was 3 percent of the world total, compared to only 0.6 percent in 1959. Algeria, Libya and Nigeria accounted for most of the rising output. The completion of a second pipeline to the coast in Libya opened up the Oasis company's Dahra field. In Algeria, output was further expanded under the continued French operation of oil facilities in that country. Sino-Soviet-bloc crude production increased 152 million barrels, representing 17 percent of the world total for crude production. Crude output in the U.S.S.R. was reported at 1,358 million barrels of which an estimated 15 percent was exported to the free world as crude and refined products.

In the Western Hemisphere, only Venezuela and the United States showed significant gains in crude production. Expansion of 102 million barrels in Venezuelan output was made possible by the growing market for heavy crude and fuel oil in Western Europe. Venezuelan crude shipments to the United States continued to be stabilized by import controls. U.S. crude output increased 54 million barrels during the year.

The growth of world refining activity stimulated the movement of crude petroleum in foreign trade in 1962. Based on reported exports from producing countries, total crude movements were 3,366 million barrels and exceeded the previous year by about 382 million barrels. Within the free world, most of the increased movement was from Middle-East producing countries to Western Europe. Soviet crude movements to the free world, mainly from the U.S.S.R. to countries in Western Europe, were estimated to be 124 million barrels compared to 119 million barrels in 1961.

Refinery output from crude distillation and downstream processing continued to expand during the year. World-product output reached 9,234 million barrels, 711 million barrels above the 1961 level. The largest gain, 203 million barrels, was in Western Europe, mainly West Germany, Italy, United Kingdom, Netherlands, and France. Japan, with an increase of 38 million barrels, continued to dominate the refining picture in Asia and accounted for 46 percent of area output. Although refinery construction and expansion programs in the Sino-Soviet-bloc countries are reported to have been revised downward, estimated refinery output was 135 million barrels above 1961. Most of the expansion was in the U.S.S.R. In the Western Hemisphere, U.S. refinery output increased 95 million barrels—14 million barrels in Canada, 27 million barrels in Venezuela, 24 million barrels in Brazil, and 13 million barrels in Argentina. Among the major products in free-world output, residual fuel oil showed the greatest quantity gain with an increase of 181 million barrels. Percentagewise, residual fuel-oil output rose 9 percent; distillate fuel oil output 10 percent; gasoline 6 percent; and other products, including petrochemical feedstocks, 6 percent.

---

[5] Jack V. Hightower, Minerals analyst.

Based on reported exports from refining countries, movements of refined products in international trade increased about 121 million barrels to 1,632 million barrels in 1962. Soviet refined product movements to free world countries were estimated at 95 million barrels, compared to 91 million barrels in 1961. Reported world imports of 1,470 million barrels of products for the year are believed understated by about 162 million barrels. This is attributed to the lack of reliable trade statistics for a number of the smaller countries and frequent omission in published statistics of data on bonded bunkers and deliveries for military consumption. For the first time, free world and area totals for international bunkers are shown in the annual report. Improved coverage of international bunker trade has made it possible to show actual data or estimates of bunkers for most countries. Free-world bunkers for 1962 are estimated at 528 million barrels. In addition to residual fuel oil and distillate fuel bunker loadings, country data include, where available, aviation gasoline and jet fuel bunkers. No bunker data were available for the Sino-Soviet-bloc countries.

Based on the apparent demand or actual demand shown for the various countries, the estimated world demand for petroleum products (including refinery fuel and losses and international bunkers) was 9,094 million barrels in 1962, an increase of 705 million barrels over 1961. Industrialized areas, particularly the United States, the U.S.S.R., and Western Europe, account for the bulk of world consumption. Western Europe registered the greatest gain in demand in 1962, or 260 million barrels, followed by the United States with an increase of 154 million barrels. In Asia, Japanese consumption continued to rise and increased 26 million barrels. Significant increases in demand were also reported in Canada, Brazil, Argentina, Venezuela, Australia, and India.

Among the major products in free-world demand in 1962, residual fuel oil registered the greatest gain, with an increase of 210 million barrels, mainly in Western Europe, Japan in Asia, and in South America. Distillate fuel oil was next with an increase of 112 million barrels, with gains registered in most of the industrialized countries. Gasoline, largely motor fuel, was up 104 million barrels, and again the gain was for the most part in the United States and Western Europe. Combined kerosine and jet fuel demand was up 57 million barrels as a result of the expanding use of these fuels in aviation transport. "Other" products also showed a large expansion to 78 million barrels in 1962, reflecting the increasing use of liquefied petroleum gases.

The indicated new supply of refined petroleum products in the free world for 1962 is estimated at 8,152 million barrels, an increase of 631 million barrels. New supply is derived from the free-world output of 7,803 million barrels of refined products; plus the estimated shipment of 95 million barrels of refined products from the Sino-Soviet bloc to the free world; plus 179 million barrels of natural-gas liquids produced in the United States and used directly for chemicals and fuels; plus an estimated 75 million barrels of similar liquids produced elsewhere in the free world. The apparent gap of 394 million barrels between estimated new supply and the reported free-world demand of 7,758 million barrels in 1962 is attributed to understated imports and the calculation of demand on an apparent basis for a number of countries, with no account being taken of stock changes.

TABLE 89.—World production of crude petroleum by countries [1]

(Thousand barrels [2])

Country	1958	1959	1960	1961	1962 [3]
North America:					
Canada	165,496	184,778	189,534	220,861	244,139
Cuba [4]	344	192	[5] 108	[5] 80	[5] 90
Mexico	93,533	96,393	99,049	106,784	111,830
Trinidad	37,355	40,919	42,357	45,768	48,877
United States	2,449,016	2,574,590	2,574,933	2,621,759	2,676,185
Total	2,745,744	2,896,872	2,905,981	2,995,251	3,081,121
South America:					
Argentina	35,829	44,710	64,232	84,418	98,154
Bolivia	3,435	3,170	3,574	2,989	2,911
Brazil	18,919	23,590	29,613	34,815	33,401
Chile	5,568	6,428	7,231	9,263	11,690
Columbia	46,901	53,576	55,770	53,247	51,918
Equador	3,108	2,759	2,730	2,926	2,573
Peru	18,732	17,733	19,255	19,371	21,134
Venezuela	950,796	1,011,452	1,041,708	1,065,790	1,167,954
Total	1,083,288	1,163,418	1,224,113	1,272,819	1,389,735
Europe:					
Albania	2,690	3,504	4,857	4,337	4,937
Austria	19,548	16,946	16,874	16,237	16,694
Bulgaria	1,632	1,402	1,460	1,510	1,460
Czechoslovakia	718	834	929	1,045	1,150
France	9,983	11,594	14,233	15,578	17,071
Germany, West	32,119	36,981	40,076	44,968	48,946
Hungary	6,325	7,897	9,270	11,102	12,208
Italy	10,531	11,551	13,613	13,434	12,308
Netherlands	11,306	12,367	13,378	14,271	14,742
Poland	1,298	1,277	1,442	1,503	1,502
Rumania	84,490	83,496	85,712	86,321	88,420
U.S.S.R. [6]	826,477	945,766	1,079,371	1,212,300	1,357,800
United Kingdom	591	612	649	810	820
Yugoslavia	3,267	4,188	6,671	9,479	10,785
Total [6]	1,010,975	1,138,415	1,288,535	1,432,895	1,588,843

See footnotes at end of table.

TABLE 89.—World production of crude petroleum by countries [1]—Continued

Country	1958	1959	1960	1961	1962 [3]
Asia:					
Bahrain	14,823	16,473	16,500	16,444	16,446
Burma	3,454	3,967	4,078	4,194	4,366
China [5]	6,000	15,330	24,959	48,743	51,100
India	3,258	3,377	3,370	3,356	7,337
Indonesia	118,711	139,038	152,988	155,369	167,771
Iran	301,361	344,800	385,748	431,653	481,939
Iraq	266,125	311,193	353,833	365,594	366,832
Israel	642	925	932	1,133	1,126
Japan	2,563	2,852	3,678	4,590	5,316
Kuwait	509,654	504,855	594,278	600,226	669,284
Kuwait-Neutral Zone	29,469	42,438	49,829	65,153	89,047
Pakistan	2,272	2,333	2,636	2,829	3,338
Qatar	63,412	61,431	63,088	64,386	67,911
Sarawak and Brunei	39,551	40,072	34,005	30,551	28,286
Saudi Arabia	370,486	399,821	456,453	508,269	555,056
Taiwan (Formosa)	15	13	14	17	14
Trucial States	------	------	------	------	5,551
Turkey	2,379	2,700	2,624	3,075	4,157
Total [6]	1,734,175	1,891,618	2,149,013	2,305,582	2,524,877
Africa:					
Algeria	[7] 3,315	[7] 9,686	[7] 67,613	[7] 121,494	[7] 158,094
Angola	358	361	477	757	3,404
Congo, Republic of (formerly French)	------	------	365	724	926
Gabon, Republic of	3,550	5,295	5,626	5,446	5,992
Libya	------	------	------	6,642	67,052
Morocco	560	712	695	603	968
Nigeria	1,970	4,067	6,552	16,802	24,624
Senegal	------	------	12	16	3
United Arab Republic (Egypt)	21,960	21,303	23,968	26,129	32,321
Total	31,713	41,424	105,308	178,613	293,384
Oceania:					
Netherlands New Guinea	1,850	1,656	1,538	1,082	917
New Zealand	5	5	5	4	4
Total	1,855	1,661	1,543	1,086	921
World total	6,607,750	7,133,408	7,674,493	8,186,246	8,878,881

[1] This table incorporates some revisions.
[2] 42 gallon barrels.
[3] Preliminary figures.
[4] Natural naphtha and gas oil.
[5] Estimate.
[6] U.S.S.R. in Asia (including Sakhalin) included with U.S.S.R. in Europe.
[7] Including Sahara.

Compiled by Pearl J. Thompson, Division of Foreign Activities.

TABLE 90.—World supply and demand of crude petroleum and refined products

(Thousands of barrels)

Country	1961								
	Crude Petroleum					Refined Products			
	Production	Imports	Exports and re-exports	Stock change, other demand and loss	Total [1] refinery input / Total [2] refinery output	Imports	Exports and re-exports	Domestic demand (including bunkers) [3]	Bunkers all flags (as reported)
North America:									
Bermuda	------	------	------	------	------	1, 785	------	1, 785	1, 385
Canada	220, 861	133, 249	66, 600	−6, 415	296, 122	29, 918	3, 516	[4] 315, 565	12, 744
Mexico	106, 784	132	6, 683	−535	118, 961	6, 683	8, 657	[4] 104, 427	365
United States (including Alaska and Hawaii)	2, 621, 758	381, 548	3, 227	+12, 921	3, 156, 605	318, 118	60, 336	[4] 3, 579, 203	71, 825
Total	2, 949, 403	514, 929	76, 510	+5, 971	3, 571, 688	356, 504	72, 509	4, 000, 980	[5] 86, 319
Central America and Caribbean:									
Costa Rica	------	------	------	------	------	1, 326	------	1, 326	[6] 70
Cuba	[6] 80	[6] 21, 573	------	+80	[6] 21, 753	[6] 7, 218	------	28, 971	[6] 370
Dominican Republic	------	------	------	------	------	2, 154	------	2, 154	[6] 75
El Salvador	------	------	------	------	------	1, 442	------	1, 442	------
Guatemala	------	------	------	------	------	3, 681	------	3, 681	[6] 300
Haiti	------	------	------	------	------	[6] 745	------	745	------
Honduras, Republic	------	------	------	------	------	[6] 1, 848	------	1, 848	------
Honduras, British	------	------	------	------	------	[6] 122	------	122	------
Jamaica	------	------	------	------	------	6, 605	------	6, 605	1, 511
Nicaragua	------	------	------	------	------	1, 418	------	1, 418	------
Panama, Canal Zone	------	------	------	------	------	9, 959	2, 242	7, 717	6, 856
Panama, Republic	------	------	------	------	------	2, 921		2, 921	------
Puerto Rico	------	26, 478	------	−365	32, 308	9, 717	17, 049	24, 976	1, 083
Total	80	48, 231	------	−285	54, 061	49, 156	19, 291	83, 926	[5] 10, 265
South America:									
Argentina	84, 418	13, 220	224	+5, 302	92, 112	13, 887	280	[4] 102, 441	1, 690
Barbados	------	167	------	------	167	336	------	503	[6] 44
Bolivia	2, 989	------	743	+1	2, 245	137	70	[4] 2, 317	------
Brazil	34, 815	54, 195	7, 699	+1, 331	79, 980	24, 197	619	[4] 103, 163	[6] 2, 446
British Guiana	------	------	------	------	------	3, 385	------	3, 385	------
Chile	9, 263	3, 142	------	+175	12, 230	[6] 4, 022	------	16, 252	[6] 270
Colombia	53, 247	------	27, 530	+143	28, 251	[6] 1, 466	2, 590	27, 127	[6] 1, 204
Ecuador	2, 926	789	------	−501	4, 216	247	------	4, 463	[6] 75

Falkland Islands	------	------	------	------	------	459	------	459	120
Netherlands Antilles	------	270,647	2,286	+887	299,275	25,810	251,526	73,559	26,311
Paraguay	------	------	------	------	------	892	------	892	------
Peru	19,371	------	2,520	+237	16,789	3,943	2,251	[4] 19,713	322
Surinam	------	------	------	------	------	1,032	------	1,032	------
Trinidad	45,768	62,847	4,338	+552	104,200	70	83,189	[4] 19,037	15,066
Uruguay	------	9,340	------	−457	9,797	1,006	------	10,803	1,554
Venezuela	1,065,790	------	743,711	−16,590	346,839	325	273,253	[4] 58,345	17,374
Total	1,318,587	414,347	789,051	−8,920	996,101	81,214	613,778	443,491	[5] 66,476
Western Europe:									
Austria	16,237	3,931	5,325	+248	15,417	10,345	666	[4] 23,371	------
Belgium and Luxembourg	------	57,734	------	−1,591	59,477	25,981	17,104	68,354	7,183
Denmark	------	1,729	------	−58	3,044	42,662	515	[4] 42,979	1,664
Finland	------	10,196	------	+725	9,471	11,328	------	20,799	[6] 62
France	15,578	262,059	------	+1,769	276,093	17,295	61,673	[4] 230,305	13,267
Germany, West	44,968	216,403	------	−2,239	263,610	46,973	35,051	[4] 286,471	17,323
Greece	------	13,499	------	+105	13,394	5,558	------	18,952	6,587
Iceland	------	------	------	------	------	[6] 2,777	------	2,777	[6] 825
Ireland	------	10,858	------	−36	10,894	3,810	3,676	11,028	754
Italy	13,434	249,834	3,248	+5,088	268,335	16,486	55,485	[4] 198,444	30,002
Malta	------	------	------	------	------	1.074	------	1,074	398
Netherlands	14,271	141,166	------	+9,630	166,606	37,051	85,070	118,587	28,264
Norway	------	12,160	------	−340	[6] 12,500	20,502	4,745	28,257	2,559
Portugal	------	9,744	------	−717	10,461	4,983	1,686	[4] 14,082	3,177
Spain	------	34,983	------	+7	36,011	2,218	745	[4] 42,227	2,627
Sweden	------	19,024	------	+136	18,888	78,829	860	96,857	3,958
Switzerland	------	------	------	------	------	31,257	45	31,212	------
United Kingdom	810	348,390	------	−5,765	354,965	101,816	57,997	[4] 378,702	28,503
Yugoslavia	9,479	2,127	1,262	+291	10,053	1,475	662	10,866	[6] 300
Total	114,777	1,393,837	9,835	+7,253	1,529,219	462,420	325,980	1,625,344	[5] 147,453
Middle East:									
Aden	------	39,738	------	+706	39,032	11,023	22,830	[7] 27,225	26,073
Bahrain	16,444	63,406	------	−39	79,889	562	69,522	[7] 11,207	3,895
Cyprus	------	------	------	------	------	2,288	------	2,288	------
Iran	431,653	------	306,442	+1,702	123,509	------	69,366	[4] 49,536	14,453
Iraq	365,594	------	347,047	+1,690	16,857	[6] 12	------	16,869	[6] 150
Israel	1,133	[6] 10,760	------	−580	12,473	4,173	[6] 303	[4] 15,624	[6] 736
Jordan	------	1,532	------	+132	[6] 1,400	692	------	2,092	------
Kuwait	600,226	------	538,296	−503	62,433	12	31,196	[7] 31,249	21,074
Lebanon	------	5,415	------	------	5,415	6,092	[6] 259	11,248	[6] 1,028
Neutral Zone	65,153	------	52,239	−886	[6] 16,300	------	[6] 7,430	[7] 8,870	3,886
Qatar	64,386	------	64,134	------	[6] 252	[6] 244	------	496	------
Saudi Arabia	508.269	------	416,822	+635	90,812	48	63,320	[7] 22,724	[6] 13,800
Syria	------	5,724	------	+5	5.719	1,060	249	6,530	[6] 75
Trucial States	------	------	------	------	------	[6] 196	------	196	------
Turkey	3,075	1,225	------	−288	4,588	9.912	159	[4] 12,938	[6] 300
Total	2,055,933	127,800	1,724,980	+2,574	458,679	36,314	264,634	219,092	[5] 85,470

See footnotes at end of table.

TABLE 90.—World supply and demand of crude petroleum and refined products—Continued

(Thousands of barrels)

Country	1961								
	Crude Petroleum					Refined Products			
	Production	Imports	Exports and re-exports	Stock change, other demand and loss	Total[1] refinery input / Total[2] refinery output	Imports	Exports and re-exports	Domestic demand (including bunkers)[3]	Bunkers all flags (as reported)
Africa:									
Algeria	121,494	----------	117,092	+3,671	[6] 731	9,401	----------	[4] 14,740	2,941
Angola	757	857	33	+54	1,527	663	508	1,682	507
Cameroun, Fed. Rep	----------	----------	----------	----------	----------	[6] 1,051	----------	1,051	----------
Canary Islands	----------	19,453	----------	−2,458	[6] 30,305	[6] 1,724	[6] 17,314	14,715	9,198
Cape Verde Islands	----------	----------	----------	----------	----------	[6] 3,328	----------	3,328	[6] 3,306
Congo, Rep. of the	----------	----------	----------	----------	----------	2,650	----------	2,650	[6] 75
Egypt, U.A.R	26,129	20,440	12,032	+696	33,841	[6] 5,038	[6] 586	[4] 31,881	2,730
Ethiopia	----------	----------	----------	----------	----------	935	----------	935	[6] 75
States formerly in French Equatorial Africa	724	----------	374	+350	----------	1,148	----------	[4] 1,213	----------
States formerly in French West Africa	16	----------	----------	+16	----------	11,069	----------	11,069	6,669
Gabon	5,446	----------	5,452	−6	----------	314	----------	314	----------
Ghana	----------	----------	----------	----------	----------	3,369	----------	3,369	106
Kenya	----------	----------	----------	----------	----------	6,048	172	[4] 6,160	994
Liberia	----------	----------	----------	----------	----------	460	----------	460	[6] 40
Libya	6,642	----------	5,244	+1,398	----------	1,467	----------	1,467	----------
Malagasy Republic	----------	----------	----------	----------	----------	1,018	----------	1,018	----------
Morocco, Spanish	----------	----------	----------	----------	----------	6,359	----------	6,359	3,592
Morocco	603	938	----------	−362	1,903	5,230	7	[4] 6,381	1,913
Mozambique	----------	3,418	----------	+334	3,084	1,065	[6] 746	3,403	[6] 837
Nigeria	16,802	----------	16,345	+457	----------	7,016	----------	7,016	44
Rhodesia and Nyasaland, Fed. of	----------	----------	----------	----------	----------	4,389	29	4,360	----------
Sierra Leone	----------	----------	----------	----------	----------	2,813	----------	2,813	2,186
Somali Republic	----------	----------	----------	----------	----------	150	----------	150	----------
Somaliland, French	----------	----------	----------	----------	----------	8,775	----------	8,775	[6] 8,610
South Africa, Rep. of	----------	11,083	----------	+692	10,395	21,191	789	[4] 28,001	3,935
Sudan	----------	----------	----------	----------	----------	3,396	----------	3,396	----------
Tanganyika	----------	----------	----------	----------	----------	2,411	355	[4] 2,145	11
Tunisia	----------	----------	----------	----------	----------	4,158	----------	[4] 4,141	164
Uganda	----------	----------	----------	----------	----------	1,213	161	1,052	32
Total	178,613	56,189	156,572	+4,842	81,786	117,849	20,667	174,044	[5] 47,965

South Asia, Far East, and Oceania:									
Afghanistan						1,100		1,100	
Australia		92,374		+297	94,058	11,668	13,964	[4] 84,095	9,616
British Borneo	30,551		14,253	−579	16,877	929	12,870	4,936	891
Burma	4,194	90		+542	3,742	555	101	[4] 4,225	[6] 300
Ceylon						4,478	47	4,431	2,754
Fiji						928	39	889	371
Hong Kong						9,763	169	9,594	[6] 2,678
India	3,356	46,881		+2,401	[6] 47,836	14,566	1,478	60,924	3,026
Indonesia	155,369	19,606	86,811	+998	87,166	[6] 4,250	47,190	[4] 39,043	7,513
Japan	4,590	243,159		+4,845	242,904	62,234	5,416	299,722	38,259
Korea, South						5,254		[4] 5,675	[6] 75
Laos						326		326	
Malaya and Singapore		9,654	5,821	+444	13.337	49,840	21,396	41,781	[6] 17,266
Netherlands New Guinea	1,082		1,082			(8)		(8)	
New Caledonia						567		567	[6] 150
New Zealand	4			+4		[6] 14,809		14,809	775
Pakistan	2,829			+46	2,783	[6] 15,889		18,672	2,040
Philippines		16,838		−1,646	18,484	3,700		22,184	[6] 232
Taiwan	17	10,011		+1,800	8,228	157	564	7,821	398
Thailand						9,562		9,562	639
Vietnam, South (includes Cambodia)						6,747		6,747	73
Total	201,992	438,613	107,967	+9,152	535,415	217,322	103,234	637,103	[5] 87,056
Total excluding Eastern Europe, U.S.S.R., and Mainland China	6,819,385	2,993,946	2,864,915	+20,587	7,226,949	1,320,779	1,420,093	7,183,980	[5] 531,004
Total Sino-Soviet bloc (excluding Cuba)	1,366,861	5,642	119,245	−43,142	1,296,400	(8)	91,206	1,205,194	
Total world	8,186,246	2,999,588	2,984,160	−22,555	8,523,349	1.320,779	1,511,299	8,389,174	
1962[9]									
North America:									
Bermuda						[6] 1,785		1,785	[6] 1,385
Canada	244,139	134,518	91,580	−21,729	310,131	30,381	5,220	[4] 335,065	[6] 12,744
Mexico	111,830		7,157	+1,886	118,450	5,926	11,230	[4] 106,147	[6] 368
United States (incl. Alaska and Hawaii)	2,676,185	411,039	1,786	+15,807	3,252,478	347,953	59,511	[4] 3,733,165	65,442
Total	3,032,154	545,557	100,523	−4,036	3,681,059	386,045	75,961	4,176,162	[5] 79,939
Central America and Caribbean:									
Costa Rica						1,579		1,579	[6] 70
Cuba	[6] 90	[6] 22,000		+90	[6] 22,000	[6] 7,220		29,220	[6] 370
Dominican Republic						[6] 2,673		[4] 2,673	[4] 75
El Salvador						[6] 1,686		1,686	
Guatemala						3,521		3,521	[6] 300
Haiti						[6] 756		756	
Honduras Republic						[6] 1,658		1,658	
Honduras, British						[6] 122		122	
Jamaica						5,930		5,930	[6] 1,511
Nicaragua						1,510		1,510	

See footnotes at end of table.

TABLE 90.—World supply and demand of crude petroleum and refined products—Continued

(Thousands of barrels)

Country	1962[9]								
	Crude Petroleum					Refined Products			
	Production	Imports	Exports and re-exports	Stock change, other demand and loss	Total[1] refinery input / Total[2] refinery output	Imports	Exports and re-exports	Domestic demand (including bunkers)[3]	Bunkers all flags (as reported)
Central America and Caribbean—Continued									
Panama, Canal Zone	-----	-----	-----	-----	-----	11,523	2,184	9,339	8,828
Panama, Republic	-----	[6] 7,000	-----	+100	[6] 7,100	[6] 3,466	1,604	8,962	-----
Puerto Rico	-----	30,147	-----	+137	34,652	5,003	15,930	23,725	[6] 1,083
Total	90	59,147	-----	+327	63,752	46,647	19,718	90,681	[5] 12,237
South America:									
Argentina	98,154	7,527	1,886	−1,544	105,339	12,422	5,001	[4] 110,665	1,481
Barbados	-----	[6] 213	-----	-----	213	[6] 1,298	-----	1,511	[6] 44
Bolivia	2,911	-----	454	−220	2,677	101	8	[4] 2,492	-----
Brazil	33,401	73,539	2,255	+797	103,888	[6] 11,146	375	114,659	[6] 2,446
British Guiana	-----	-----	-----	-----	-----	[6] 2,483	-----	2,483	-----
Chile	11,690	6,866	-----	+3,440	15,116	[6] 4,038	-----	19,154	370
Colombia	51,918	-----	24,312	+105	30,306	[6] 1,834	4,279	[4] 23,402	[6] 1,204
Ecuador	2,573	416	-----	−944	3,933	1,690	-----	5,623	[6] 75
Falkland Islands	-----	-----	-----	-----	-----	[6] 459	-----	459	[6] 120
Netherlands Antilles	-----	272,498	2,976	−4,088	307,829	37,422	263,203	82,048	20,914
Paraguay	-----	-----	-----	-----	-----	922	-----	922	-----
Peru	21,134	668	2,759	+1,042	18,196	3,716	1,491	[4] 21,989	292
Surinam	-----	-----	-----	-----	-----	2,413	-----	2,413	-----
Trinidad	48,877	64,020	6,829	−2,822	109,389	249	89,824	[4] 17,538	12,893
Uruguay	-----	10,588	-----	−119	10,707	1,130	-----	11,837	[6] 1,552
Venezuela	1,167,954	-----	810,485	−6,911	374,299	[6] 361	291,364	[4] 60,103	18,461
Total	1.438,612	436,335	851,956	−11,264	1,081,892	81,684	655,545	477,298	[5] 59,852
Western Europe:									
Austria	16,694	4,540	[6] 3,440	−222	19,007	12,083	1,547	[4] 27,642	-----
Belgium and Luxembourg	-----	[6] 64,598	-----	-----	64,598	31,563	18,280	77,881	7,744
Denmark	-----	9,240	-----	+748	9,934	46,405	3,984	52,355	1,946
Finland	-----	11,127	-----	+94	11,033	14,059	4	25,088	[6] 57

France	17,071	277,920	-----	−2,436	297,656	21,440	55,400	[4] 262,562	14,341
Germany, West	48,946	245,400	-----	+650	303,188	82,825	30,966	[4] 358,325	17,589
Greece	-----	10,783	-----	−2,623	13,406	7,749	-----	[4] 24,310	6,926
Iceland	-----	-----	-----	-----	-----	[6] 2,478	-----	2,478	[6] 800
Ireland	-----	11,315	-----	−114	11,429	4,074	2,715	[4] 13,187	[6] 754
Italy	12,308	293,640	2,275	−2,009	320,573	22,959	62,170	[4] 243,673	34,069
Malta	-----	-----	-----	-----	-----	[6] 1,074	-----	1,074	[6] 398
Netherlands	14,742	146,404	-----	−2,437	[6] 192,564	37,133	88,166	141,531	29,524
Norway	-----	16,485	-----	+1,185	[6] 17,200	21,173	9,110	29,263	[6] 2,559
Portugal	-----	9,924	-----	−444	10,368	5,048	1,166	[4] 14,946	3,169
Spain	-----	37,716	-----	−3,118	42,132	2,056	1,168	43,020	2,018
Sweden	-----	18,019	-----	−1,719	19,738	89,148	1,123	107,763	[6] 3,958
Switzerland	-----	-----	-----	-----	-----	35,561	71	35,490	-----
United Kingdom	820	374,343	-----	+3,120	386,997	132,264	72,316	[4] 413,345	26,760
Yugoslavia	10,785	[6] 3,640	[6] 2,550	−10	11,885	[6] 1,041	[6] 876	12,050	[6] 300
Total	121,366	1,535,094	8,265	−9,335	1,731,708	570,133	349,062	1,885,983	152,912
Middle East:									
Aden	-----	46,684	-----	+1,766	[6] 44,918	8,022	24,571	[7] 28,369	25,306
Bahrain	16,446	71,934	-----	−90	88,680	358	76,480	[7] 12,139	5,447
Cyprus	-----	-----	-----	-----	-----	[6] 2,288	-----	2,288	-----
Iran	481,939	-----	340,748	+2,207	138,984	[6] 224	82,559	[4] 53,422	16,786
Iraq	366,832	-----	349,174	+117	17,541	[6] 14	-----	17,555	[6] 150
Israel	1,126	[6] 15,208	-----	-----	16,334	[6] 2,770	[6] 1,278	[4] 17,288	[6] 736
Jordan	-----	[6] 1,727	-----	−305	[6] 2,032	[6] 499	-----	2,531	-----
Kuwait	669,284	-----	599,630	−271	69,925	[6] 12	33,452	[7] 36,485	24,355
Lebanon	-----	6,224	-----	-----	6,224	[6] 6,092	[6] 260	12,056	[6] 1,028
Neutral Zone	89,047	-----	63,047	+2,994	28,823	-----	18,877	9,946	3,661
Qatar	67,911	-----	67,728	+33	[6] 150	[6] 244	-----	394	-----
Saudi Arabia	555,056	-----	462,609	+1,512	90,935	28	62,507	[4] 23,182	[6] 14,800
Syria	-----	5,856	-----	-----	[6] 5,856	346	438	5,764	[6] 75
Trucial States	5,551	-----	[6] 5,551	-----	-----	[6] 196	-----	196	-----
Turkey	4,157	[6] 17,000	-----	-----	21,157	[6] 10,890	3,629	[4] 16,764	336
Total	2,257,349	164,633	1,888,487	+7,963	531,559	31,983	304,051	238,379	[5] 92,680
Africa:									
Algeria	158,094	-----	157,995	−547	[6] 646	6,625	-----	7,271	[6] 2,952
Angola	3,404	-----	948	−72	2,528	511	578	[4] 2,402	[6] 411
Cameroun, Fed. Republic	-----	-----	-----	-----	-----	1,018	-----	1,018	-----
Canary Islands	-----	30,917	-----	+897	[6] 39,982	1,174	20,729	20,457	[6] 9,422
Cape Verde Islands	-----	-----	-----	-----	-----	[6] 3,337	-----	3,337	[6] 3,306
Congo, Rep. of the	-----	-----	-----	-----	-----	[6] 2,648	-----	2,648	[6] 75
Egypt, U.A.R.	32,321	24,969	19,715	−820	38,395	4,634	3,610	39,419	[6] 2,960
Ethiopia	-----	-----	-----	-----	-----	[6] 960	-----	960	[6] 75
States formerly in French Equatorial Africa	926	-----	1,061	−135	-----	1,244	-----	1,244	-----
States formerly in French West Africa	3	-----	-----	+3	-----	11,911	-----	11,911	[6] 6,669
Gabon	5,992	-----	5,705	+287	-----	312	-----	312	-----
Ghana	-----	-----	-----	-----	-----	3,913	4	3,909	[6] 106
Kenya	-----	-----	-----	-----	-----	6,533	363	6,170	[6] 935

See footnotes at end of table.

TABLE 90.—World supply and demand of crude petroleum and refined products—Continued

(Thousands of barrels)

Country	1962[9]								
	Crude Petroleum					Refined Products			
	Production	Imports	Exports and re-exports	Stock change, other demand and loss	Total[1] refinery input / Total[2] refinery output	Imports	Exports and re-exports	Domestic demand (including bunkers)[3]	Bunkers all flags (as reported)
Africa—Continued									
Liberia						[6] 459		459	[6] 40
Libya	67,052		65,511	+1,541		1,626		1,626	
Malagasy Republic						1,078		1,078	
Morocco, Spanish						[6] 6,359		6,359	[6] 3,592
Morocco	968	[6] 1,721		+9	2,680	2,575		[4] 6,847	[6] 1,628
Mozambique		2,933		−397	3,330	558	[6] 1,524	2,364	[6] 885
Nigeria	24,624		24,553	+71		[6] 6,272		6,272	[6] 34
Rhodesia and Nyasaland, Fed. of						[6] 4,768		4,768	
Sierra Leone						2,790		2,790	[6] 1,800
Somali Republic						[6] 150		[6] 150	
Somaliland, French						[6] 9,805		9,805	[6] 8,610
South Africa, Rep. of		12,107		+211	11,896	21,814	340	[4] 29,610	4,064
Sudan						[6] 3,768		3,768	
Tanganyika						2,646	400	[4] 2,314	[6] 11
Tunisia						4,243		[4] 4,411	174
Uganda						1,328	285	1,043	[6] 32
Total	293,384	72,647	275,488	+1,048	99,457	115,059	27,833	184,722	[5] 47,781
South Asia, Far East, and Oceania:									
Afghanistan						[6] 1,100		1,100	
Australia		96,218		−456	99,985	13,390	15,985	[4] 90,212	8,877
British Borneo	28,286		14,195	−2,521	[6] 17,506	947	14,772	3,681	582
Burma	4,366			+442	3,924	439	85	4,278	[6] 300
Ceylon						4,905	6	4,899	2,156
Fiji						1,015	49	966	441
Hong Kong						11,032	195	10,837	[6] 2,850
India	7,337	43,967		−379	51,737	21,685	2,003	[4] 66,349	2,930
Indonesia	167,771	9,208	92,202	+8,028	[6] 81,298	[6] 5,745	[6] 36,378	[4] 40,007	6,034
Japan	5,316	280,416		+3,929	281,803	68,279	4,988	[4] 326,139	33,905
Korea, South						7,316		[4] 7,007	[6] 75

Laos	----------	----------	----------	----------	----------	239	----------	239	----------
Malaya and Singapore	----------	24,169	9,586	+1,822	[6] 39,130	50,331	29,535	59,926	19,215
Netherlands New Guinea	917	----------	[6] 917	----------	----------	[6] 364	----------	364	----------
New Caledonia	----------	----------	----------	----------	----------	[6] 568	----------	568	[6] 150
New Zealand	4	----------	----------	+4	----------	15,152	----------	15,152	[6] 775
Pakistan	3,338	2,461	----------	+531	5,268	14,925	18	[4] 20,021	2,324
Philippines	----------	26,320	----------	+3,075	23,245	[6] 1,691	153	24,783	[6] 232
Taiwan	14	8,636	----------	−922	9,572	265	683	9,154	467
Thailand	----------	----------	----------	----------	----------	12,034	----------	12,034	1,101
Vietnam, South (incl. Cambodia)	----------	----------	----------	----------	----------	[6] 6,769	----------	6,769	[6] 73
Total	217,349	491,395	116,900	+13,553	613,468	238,191	104,850	704,485	[5] 82,487
Total excluding Eastern Europe, U.S.S.R., and Mainland China	7,360,304	3,304,808	3,241,619	−1,744	7,802,895	1,469,742	1,537,020	7,757,710	[5] 527,888
Total Sino-Soviet bloc [6] (excl. Cuba)	1,518,577	3,650	124,000	−32,473	1,430,700	([8])	94,900	1,335,800	----------
Total world	8,878,881	3,308,458	3,365,619	−34,217	9,233,595	1,469,742	1,631,920	9,093,510	----------

---

[1] Total input includes crude runs to stills plus runs of other unfinished oils, topped crude, and natural-gas liquids blended.

[2] Total output includes refined product output plus refinery fuel and loss; excludes liquefied-petroleum gases sold directly for fuel and chemical uses from natural-gasoline plants.

[3] Unless otherwise specified, data represent apparent domestic demand (including inland demand, refinery fuel and loss, and bunkers). Apparent domestic demand is derived from the components of refined-product output, plus imports, minus exports, with no allowance for changes in stocks.

[4] Domestic demand as reported, including refinery fuel and loss, stock changes, and bunkers; also includes, where available, liquefied petroleum gases sold directly for fuel and chemical uses from natural-gasoline plants.

[5] Totals include listed data only.

[6] Estimate based on latest available data.

[7] Apparent domestic demand is heavily influenced by refinery fuel and loss, bunker loadings, and inventory changes.

[8] Insignificant.

[9] Preliminary.

NATIVE ASPHALT

Bituminous limestone and sandstone.—Production of bituminous limestone increased 5.1 percent in 1962. The average value per short ton was $2.44, 10 cents per ton less than in 1961. Bituminous sandstone production in 1962 was 2,783 short tons with an average value per ton of $7.91. Sandstone production increased 29.0 percent for the year, but the average value declined 43 cents per short ton.

Gilsonite.—All gilsonite is produced in Utah. The production of gilsonite cannot be revealed by the Bureau of Mines because of the limited number of producers.

TABLE 91.—Production and value of bituminous limestone and bituminous sandstone in the United States, 1952–62

Year	Bituminous limestone		Bituminous sandstone	
	Production (Short tons)	Value (Thousand)	Production (Short tons)	Value (Thousand)
1952	1,428,562	$3,560	142,136	$1,127
1953	1,327,224	3,408	113,320	942
1954	1,191,793	2,782	146,029	905
1955	1,330,311	3,274	96,896	837
1956	1,358,669	3,223	99,864	891
1957	1,134,781	2,996	33,726	225
1958	1,305,555	3,218	20,938	125
1959	1,509,277	3,810	9,488	58
1960	1,235,658	3,009	7,216	61
1961	1,134,340	2,884	2,158	18
1962	1,192,545	2,914	2,783	22

Helium

By Harold W. Lipper[1]

◆

Contents

	Page		Page
Summary	511	Conservation	521
Production	517	Prices	523
Shipments	518	Foreign trade	523
Consumption and uses	519	Technology	523
Resources	520		

SUMMARY

A NEW record was set for helium shipment in 1962 for the 13th successive year. For the first time since 1949, the production of helium from natural gas at Bureau of Mines plants was less than in the previous year. The Bureau shipped 599.5 million cubic feet, 9 percent more than the 1961 volume, and produced 680.9 million cubic feet—a decrease of 6 percent from the record set in 1961. The Bureau added 77.2 million cubic feet to the volume stored for future use. Of the total 524.6 million cubic feet in storage, 522.4 million cubic feet is accumulated excess production from Bureau of Mines plants. The remaining 2.2 million cubic feet was purchased during 1962 from industry under the helium conservation program. The first two of five private plants began production in December to recover helium for conservation storage and ultimate use.

A 425-mile pipeline system to transport helium from the five private plants to the Cliffside field was constructed by the Bureau at a cost of about $8 million.

At the Helium Research Center, Amarillo, Tex., the pressure-volume-temperature relationships of helium and helium-nitrogen mixtures, phase relationships of helium-nitrogen mixtures, and of helium-bearing natural gases were investigated. Improved analytical techniques were developed. New projects included work directed toward measuring the heat content of helium and its mixtures with other gases; determining the absolute viscosity of helium, and the solubility of helium in liquids at low temperatures.

PRODUCTION

Bureau of Mines plants produced 680,866,534 cubic feet of helium from helium-bearing natural gas during 1962, a decrease of 6 percent from the record set in 1961. In addition, the Bureau purchased 2,215,000 cubic feet of helium produced by private industry in the helium conservation program to bring the total volume of helium extracted from natural gas in the Government helium program during 1962 to 683,081,534 cubic feet. Production continued at the plant built by Kerr-McGee Oil Industries, Inc., to extract helium from resources it owns or controls in the Pinta Dome field, Apache County, Ariz. The company markets its helium to non-Federal helium users, principally those on the west coast. Production capacity of the plant is reported to be 65 million cubic feet of helium a year.

---

[1] Technical assistant, Office of Assistant Director, Helium.

Helium extraction plants owned and operated by the Bureau of Mines at Amarillo and Exell, Tex.; Keyes, Okla.; Otis, Kans.; and Shiprock (Navajo), N. Mex., produced helium throughout the year. The Amarillo, Exell, Keyes, and Otis plants operated at essentially maximum rates, limited only by normal seasonal variations in the volumes of helium-bearing natural gas available for processing. The Navajo plant operated with a diminishing gas supply during most of the year, but in November a gas purchase agreement with Continental Oil Co. made an additional supply of helium-bearing gas available to the plant. The plant can now operate at near design capacity.

Seasonal variations in helium-bearing gas supplies to the Bureau plants resulted in reduced processing rates during the summer months when helium demand was at a peak. Shipping requirements were met by withdrawing about 35.7 million cubic feet of helium from underground storage to augment the supply of helium available from natural gas. However, the total production of helium from natural gas at Bureau plants was in excess of demand.

Excess production not needed to meet demand was added to the volume of helium in storage to increase the volume saved for future use from 447 million cubic feet to 524.6 million cubic feet.

Of the total volume in storage, 2.2 million cubic feet was purchased from private industry and represents the first results of the long-range helium conservation program initiated by the Bureau of Mines.

TABLE 1.—Helium production in the United States, 1921–62

(Thousand cubic feet)

Year	Production	Year	Production
1921–28	[1] 5, 761	1960	642, 033
1929–42	[1] 11, 776	1961	727, 103
1943–49	[1] 83, 545	1962	683, 082
1950–54	[1] 137, 957		
1955–59	[1] 313, 423	Total, 1921–62	[2] 5, 104, 894

[1] Annual average.

[2] Does not include helium produced at the private Kerr-McGee plant, but includes helium purchased for conservation.

SHIPMENTS

Helium shipments (sales) by the Bureau of Mines totaled 599,519,554 cubic feet. The Federal agencies received 467,444,286 cubic feet, and deliveries to non-Federal (commercial) consumers were 132,075,268 cubic feet. In shipping helium to its customers, Bureau plants handled shipment of 1,803 tank cars, 1,204 trailers, and 236,866 standard compressed gas cylinders. These shipments went to 42 of the 50 states and to Canada as shown in table 2.

Continued increase in helium sales required the purchase of 25 additional tank cars for delivering helium. The new cars were received in December 1962, increasing the total number of helium tank cars to 246. During the year, the Atomic Energy Commission transferred 19 of its 25 cars to Bureau ownership to facilitate their more effective utilization. The remainder were retained by the AEC for special purpose use. Despite previous divided ownership, helium tank cars were operated in a common pool; the new arrangement offers additional advantages not practical under the former system. The Bureau of Mines fleet of cars now totals 240.

Each of the five Bureau plants produces a single grade of helium having a purity of 99.995 percent or better by volume. Helium is shipped in tank cars from all the plants except Amarillo. The Amarillo plant is specially equipped to fill, ship, and maintain small cylinders, and all shipments of standard cylinders by the Bureau of Mines originate there. All plants can accommodate trailer shipments and, with the exception of the Amarillo and Otis plants, all are equipped to handle container filling pressures up to 4,000 pounds per square inch gage. The Amarillo and Otis plants are limited to a maximum container filling pressure of 2,700 pounds per square inch gage.

TABLE 2.—Volume of helium shipped, 1962

(Thousand cubic feet)

State	Volume	State	Volume
Alabama	2,735	Nebraska	37,351
Arizona	1,165	Nevada	10,896
Arkansas	173	New Jersey	62,909
California	127,743	New Mexico	25,502
Colorado	18,884	New York	15,545
Connecticut	1,522	North Carolina	187
District of Columbia	4	North Dakota	167
Florida	17,352	Ohio	38,374
Georgia	249	Oklahoma	13,010
Idaho	3,762	Oregon	325
Illinois	4,190	Pennsylvania	4,767
Indiana	6,687	South Carolina	5,443
Iowa	253	South Dakota	3,521
Kansas	21,649	Tennessee	10,035
Kentucky	42	Texas	38,494
Louisiana	1,230	Utah	458
Maryland	5,826	Virginia	129
Massachusetts	19,339	Washington	58,036
Michigan	347	Wisconsin	300
Minnesota	2,565	Wyoming	35,111
Mississippi	141	Canada	570
Missouri	2,151		
Montana	380	Total	599,519

CONSUMPTION AND USES

Federal agencies received about 78 percent of the helium shipped by the Bureau of Mines in 1962, continuing the long-term pattern of such shipments. Sale of helium from Bureau plants in 1962 increased 9 percent over the earlier record of 551.8 million cubic feet set in 1961. The volume of helium shipped from Bureau of Mines plants was delivered as follows: Air Force and NASA, 46.5 percent; Navy, 16 percent; Atomic Energy Commission, 14 percent; other Federal agencies, 1.5 percent; and non-Federal consumers, 22 percent.

Helium's usefulness stems from its combination of unique properties which include inertness, light weight, low solubility, high thermal and electrical conductivity, rapid diffusion, transparency to radioactive particles, and low liquefaction temperature.

Helium serves our Nation in many ways. Large volumes of helium are used to test complex rocket fuel and control systems. In liquid-fueled boosters for spacecraft, helium is used as a purging and pressurizing agent because of its inertness, low solubility, low liquefying temperature, light weight, and the rapidity with which large quantities will flow through small diameter tubing and openings. Helium was used in ground support equipment for all the orbital flights of American astronauts. Helium served a key role in the experiment with the Telstar satellite, where it was used to provide the low temperature (−452° F.) required by the sensitive electronic system that amplified the signals relayed from the orbiting satellite.

Helium's properties of inertness, high heat conductivity, and transparency to radioactive particles are utilized in nuclear reactors to extract heat for the production of power.

Helium and mixtures of helium and argon are used as a shielding gas in the welding of metals such as aluminum, stainless steel, and titanium. In this application, the shielding gas prevents contamination of the metal by excluding air and other objectionable gases.

Although the Navy has deactivated its fleet of helium-filled blimps, a few helium-filled lighter-than-air craft are in private use for advertising and sightseeing. Helium-filled balloons are used to take large astronomical instruments to high altitudes where the thin atmosphere improves the quality of telescopic observations. Balloons are also used for other scientific investigations concerning the presence and strength of various radioactive particles that reach the earth's upper atmosphere from space.

A new and exciting area of research involves the generation of strong magnetic fields at low power requirements by using superconducting magnets cooled to the temperature of liquid helium. Further research may lead to a means of surrounding spacecraft with a magnetic field to repel radioactive particles and a means of confining the hot gases produced in a plasma generator.

RESOURCES

There were no major additions to the known helium resources during 1962. In the continuing helium survey carried on by the Bureau of Mines, 467 samples were analyzed without discovering new deposits of helium-bearing natural gas comparable to the known major deposits.

The total helium resources of the United States in helium-bearing natural gas containing at least three-tenths percent helium by volume are estimated to be 196 billion cubic feet as of January 1, 1961. Approximately 94 percent of these resources is contained in five helium-bearing gasfields: (1) The Hugoton field of Kansas, Oklahoma, and Texas; (2) the Panhandle field of Texas; (3) the Keyes field of

Oklahoma; (4) the Greenwood field of Kansas and Colorado; and (5) the Cliffside field of Texas.

Resources available to the five Bureau of Mines helium plants represent about 10 percent of the known resources. Contracts to obtain helium for conservation are with companies that control about 60 percent of the total helium resources. The Bureau's two largest plants (Exell, Tex., and Keyes, Okla.) extract helium from gas produced within the area where the major helium resources are found. Plants at Shiprock, N. Mex., and Otis, Kans., extract helium from gas produced in small, isolated fields outside the area. The only developed source of helium-bearing natural gas owned by the Government is the Cliffside field in the Texas Panhandle not far from Amarillo. Helium from this source is extracted at the Bureau of Mines Amarillo plant.

Discoveries of helium-bearing gas deposits in eastern Utah and western-Colorado offer prospects of additional helium resources. Development of the area by private companies for oil and fuel-gas production has revealed gas deposits containing helium. However, extent of the new gasfields has not been defined fully, and fuel-gas production remains low.

Two minor helium-bearing natural gas deposits discovered on lands of the public domain were established as Helium Reserve No. 1, Woodside structure, Utah, and Helium Reserve No. 2, Harley Dome, Utah, in March 1924 and June 1933, respectively. The two reserves are quite small in relation to the present-day rate of helium use. Neither deposit has been produced, and the helium-bearing gas they contain has no value as fuel.

Recently discovered deposits of helium-bearing natural gas in Canada have led to announcement of the construction of two plants in Saskatchewan Province. Combined annual capacity of the plants is reported to be about 37 million cubic feet, and the target date reported for their completion is the spring of 1963. Reports indicate that helium produced in the plants would be marketed principally in Canadian and other foreign markets.

Helium-bearing natural gases offer the only presently known economical sources of helium production, but other occurrences are of interest. They include gases from mineral springs, fumaroles, and volcanoes; the air; rocks; minerals; certain sands; and meteorites. Helium can also be formed by nuclear bombardment and fusion.

CONSERVATION

National helium resources appear to be adequate to meet predicted demands only if the large volume now wasted in fuel gases is saved for future use. The resources are diminishing rapidly as helium-bearing natural gas is used for fuel. Unless the helium is recovered before the natural gas is consumed, the helium is lost without serving any useful purpose. The Department of the Interior launched a long-range helium conservation program in 1961 by entering into four contracts under which private industry financed, built, and will operate five plants to recover helium from natural gas before the gas goes to market. In December 1962, two of the plants began production. They are the Northern Helex Co. plant at Bushton, Kans., and the Phillips Petroleum Co. plant in Sherman County, Tex. The two plants delivered a total of 2,215,000 cubic feet during the year. The remaining three plants were in various stages of completion at yearend, and operations are scheduled to begin at all of them during the first 6 months of 1963.

Helium is purchased by the Bureau of Mines for conservation, and ultimate sale under provisions of Public Law 86–777 which amended the Helium Act of 1925 as amended (43 Stat. 1110; 50 U.S.C. 161, 163–166), and became effective March 1, 1961. Contracting authority for such purchases in an amount not to exceed $47.5 million a year became available in the act (Public Law 87–122) making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1962. All the available contracting authority was used in contracts with the four companies. Each contract is for a period of 22 years. Helium purchased in the conservation program is an impure mixture of helium and nitrogen with small amounts of hydrocarbon gases. The mixture is known as crude helium and has a nominal composition of 50 to 60 percent helium and 50 to 40 percent nitrogen. Additional information concerning the contracts is shown in the following table:

Company (parent companies in parentheses)	Plant location and date of contract	Initial unit price (for 1,000 cubic feet)	Maximum annual obligation (million dollars)	Estimated helium volume (million cubic feet)	
				Annual average	Life of contract
Northern Helex Co., (Northern Natural Gas Co.).	Bushton, Kans., Aug. 15, 1961	11.24	9.5	675	13,500
Cities Service Helex, Inc. (Cities Service Co.).	Ulysses, Kans., Aug. 22, 1961	11.78	9.1	610	12,200
National Helium Corp. (Panhandle Eastern Pipe Line Co. and National Distillers & Chemical Corp.).	Liberal, Kans., Sept. 13, 1961	11.78	15.2	1,053	21,060
Phillips Petroleum Co	Dumas, Tex., and Sherman County, Tex. (2 plants), Nov. 13, 1961.	10.30	13.7	788	15,766
Weighted average		11.29			
Total			47.5	3,126	62,526

Construction was completed on a 425-mile pipeline system to transport crude helium produced at the five new plants to underground storage in the Cliffside field near Amarillo, Tex. Cost of the pipeline owned and operated by the Bureau of Mines was about $8 million. The line was ready to accept deliveries of helium in August 1962 and was essentially completed at the end of the year. In prior years, the Bureau has stored relatively small volumes of helium produced at its plants in excess of market demands in the Cliffside field.

During the life of the present contracts for helium conservation, the Bureau estimates that production from its own plants will be about 15 billion cubic feet. The total demand during the period is predicted to be about 36 billion cubic feet. If this should be the case, 21 billion cubic feet of the helium purchased under present contracts will be purified in Bureau plants and sold, leaving 41.5 billion cubic feet in underground storage for use after about 1985, when presently known sources of helium-bearing natural gas will be largely depleted.

Helium in Conservation Storage, 1960–62

Year:	*Million cubic feet*
1960	273
1961	447. 4
1962	524. 6

PRICES

The revised Helium Act (Public Law 86–77) directs agencies of the Federal Government to purchase all major helium requirements from the Secretary of the Interior and provides that helium shall be sold at prices adequate to cover all costs of carrying out provisions of the act, including repayment to the Treasury of the United States, with interest, all funds that may be borrowed to sustain the program and the cost of all capital assets.

Until November 18, 1961, sales were at prices established in 1954, $15.50 and $19 a thousand cubic feet (f.o.b. plant) for Federal and non-Federal purchasers, respectively. An increased price to cover all costs of carrying out the provisions of the Helium Act and make the prescribed repayments was calculated to be $35 a thousand cubic feet. On November 18, 1961, the $35 price went into effect and is applicable to all users.

Changes were also made in the rates charged by the Bureau of Mines for rental of railway tank cars, semitrailers, and cylinders used in transporting helium and in the rates charged for services incident to helium sales and distribution. Although the regulations governing the sale of helium and rental of containers are applicable only to Bureau non-Federal customers, all users of services are charged at the same rates in order that costs of the program shall be shared proportionately. Revised regulations, a schedule of charges, and other information on the sale of helium and rental of containers by the Bureau of Mines are included in the Code of Federal Regulations (30 CFR 1).

FOREIGN TRADE

Small quantities of helium are exported annually under licenses approved by the Secretary of State. An important use for helium abroad is in fundamental research at temperatures near absolute zero.

TECHNOLOGY

In May 1961, a Helium Research Center was established at Amarillo, Tex., as an integral part of the helium conservation program. Some research during 1962 was related to developing and improving techniques for extracting, purifying, and saving helium. However, greater emphasis was placed on new work directed at learning more about the properties of helium in order that the conserved helium may be used wisely and effectively in furthering scientific progress and the national economy.

There are few measurements of the heat capacity of helium and its mixtures with other gases at low temperatures and high pressures. Work was begun to devise methods and equipment for obtaining the desired information. Good progress was made, but no equipment was built. Large gaps exist in data for the absolute viscosity of helium at low temperatures and high pressures, and most of the available data give the viscosity of helium relative to another gas. During 1962, a project was started at the Helium Research Center to develop a suitable method and research equipment for making the necessary measurements to obtain the missing data. Other new work included a project to determine the solubility of helium in liquids at low temperatures. The solubility of helium in liquids such as nitrogen, oxygen, and hydrogen is of particular interest.

Experiments were made to learn more about the behavior of helium when mixed with other gases at high pressures.

Results of research completed on phase equilibrium of helium-bearing natural gases were published.[2]

The pressure-volume-temperature relationships of helium and helium-nitrogen mixtures were investigated. Data were obtained on the behavior of the helium-nitrogen-methane system at low temperatures.

Applied research by the Bureau resulted in the development of a lightweight portable analyzer utilizing chromatographic principles for rapid, precise, on-the-spot analysis for helium in natural gases. A portable instrument for detecting helium leaks was developed.

---

[2] Boone, W. J., Jr., Will E. DeVaney, and John E. Miller. Low-Temperature Phase Equilibria of Helium-Bearing Natural Gases: Exell Gas. BuMines Rept. of Inv. 6008, June 1962, 20 pp.

Appendix:

Tables of Measurement

Volumetric measures

	U.S. gallons	Imperial gallons	Cubic feet	Barrels	Cubic centimeters	Liters	Cubic meter
1 U.S. gallon[1]	1	0.83268	0.13368	0.02381	3,785.4	3.7853	0.0037854
1 imperial gallon[2]	1.201	1	.16054	.028594	4,546.04	4.5460	.004546
1 cubic foot	7.4805	6.22888	1	.17811	28,317.01	28.316	.028317
1 barrel[3]	42	34.972	5.6146	1	158,987.55	158.98	.15899
1 cubic centimeter	.000026417	.0021996	.000035314	.0000062895	1	.00099997	.000001
1 liter	.26418	.219976	.035316	.0062899	1,000.027	1	.001000027
1 cubic meter	264.17	219.97	35.314	6.2898	1,000,000	999.97	1

[1] U.S. gallon=the volume occupied by 231 cubic inches.

[2] 1 imperial gallon=the volume occupied by 10 pounds of water at 62° F when weighed against brass in air at 30 inches of barometric pressure.

[3] 1 barrel=42 U.S. gallons.

Weight measures

	Pounds	Kilograms	Short or net tons	Metric tons	Long ton
1 pound	1	0.45359	0.0005	0.00045359	0.00044643
1 short of net hundredweight	100.0	45.359	.05	.04536	.04464
1 gross or long hundredweight	112.0	50.802	.056	.05080	.05
1 kilogram	2.2046	1	.0011023	.001	.0009842
1 short or net ton	2,000	907.185	1	.90718	.89286
1 metric ton	2,204.6	1,000	1.1023	1	.98421
1 long ton	2,240	1,016.06	1.12	1.01606	1

NOTE.—1 English water ton=the volume occupied by 1 long ton of water at 60° F.

Index

Page

- Anthracite. See Pennsylvania Anthracite.
- Asphalt and related bitumens (native):
  - Bituminous limestone 516
  - Bituminous sandstone 516
  - Gilsonite 516
  - Petroleum Asphalt 478
- Bituminous Coal and Lignite:
  - As source of energy 2–8
  - Auger 98–101
    - Mining 98–101
    - Sales 101
  - Cleaning equipment, types 112
  - Cleaning methods 112
    - Mechanical. *See* Bituminous coal and lignite, mechanical cleaning.
    - Pneumatic 112
  - Competitive fuels 4, 5
  - Consumption 8–13, 49, 138–141
    - At coke ovens 139, 140
    - At mines 122–133, 134, 135
    - By consumer class 140
    - By electric power utilities 140
      - Fuel economy 141
  - Deliveries, retail 140
  - Disposition 65, 66
  - Distribution 141–151
  - Drying, thermal 119–121
  - Employment 42, 47, 70, 121–133
  - Foreign trade 155–159
    - Exports 155–159
    - Imports 155, 156
  - Fuel briquets 273–290
  - Fuel efficiency 48, 49, 141
  - Mechanical cleaning 48, 109–114
    - By method of mining 113, 114
    - Growth 110
  - Mechanical crushing 114, 115
  - Mechanical loading 48, 101–108
  - Mechanization 48, 108
  - Packaged fuel 273–290
  - Preparation, thermal drying 119, 121
  - Prices 22, 23, 47, 65, 66, 121–133, 153, 154
  - Price indicators 25, 49
  - Production 2–7, 47, 49, 53–72, 121–133, 160–162
    - Auger mines 71, 98–101
      - By thickness of seams 52, 53
      - Per man-day 98–101
      - Value per ton 153
    - By days 60
    - By districts 62, 66
    - By months 58, 61, 62
    - By States, cumulative 64
    - By States and counties 121–133
    - By weeks 58, 59, 63
    - By years 54–56, 64
    - Growth 54–56, 85, 86
    - Mined by continuous mining machines 74, 105
    - Percentage crushed 114, 115
    - Strip mines 49, 56, 84–87, 88–98
      - By thickness of seams 52, 53
      - Per man-day 71, 84
      - Percentage 85, 86
      - Value per ton 85, 86, 88, 153

Page

- Bituminous Coal and Lignite—Continued
  - Production—Continued
    - Underground mines 71, 72, 76, 79
      - By thickness of seams 52, 53
      - Cut by hand 74
      - Cut by machines 74
      - Hand-loaded 49, 101–108
      - Machine-cut 74
      - Machine-loaded 49, 101–108
      - Mine cars 78–82
        - Rail 78, 80, 81
        - Rubber-tired 78, 82
      - Per man-day 71, 73
      - Shot from solid 74
      - Track 78
      - Value per ton 88, 153
    - Value 49, 55, 58, 65, 66, 121–133, 153, 154
    - Where shot holes are power-drilled 76
    - World 160–162
  - Reserves 50, 51
  - Shipments 134–137
    - Railroads 134–137
    - Trucks 134–137
    - Waterways 134–137
  - Stocks 48, 49, 57, 151, 152
  - Strip mining 84–98
    - By States and counties 94–98
  - Technology 162–164
  - Thermal drying 119–121
  - Treated to allay dust, percent 116–118
    - Production 116–118
  - Underground mining 72–83
  - Value per ton 153, 154
- Bituminous coal and lignite dust, allaying, treatment 116, 117
- Bituminous coal and lignite industry:
  - Annual review 47
  - Employment, trend 47, 54, 55
  - Salient statistics 49
- Bituminous coal and lignite mines:
  - Animal haulage 77
  - Auger 98–100
  - Capacity 48, 54, 55, 58
  - Cleaning plants, number 110, 111
    - Percentage of production 49, 110, 111
  - Coal crushing 114, 115
  - Coal-cutting machines, number 74
  - Conveyor, haulage 77, 79, 83
  - Conveyors, sales 108
  - Days active 121–133
  - Disaster 41, 42
  - Employment 42, 43, 47, 56, 57
    - Daily 121–133
  - Fatalities 41, 42
  - Haulage units, number 77–83
    - Types 77–83
  - Injuries 41, 42
  - Loading units, mechanical, number 102, 103, 106
    - Mobile, sales 108
  - Locomotives, battery 77, 78
    - Other types 77, 78
    - Trolley 77, 78
  - Man-days worked 121–133
  - Men employed 121–133
  - Mine-days active 121–133

Page

- Bituminous coal and lignite mines—Con.
  - Miners, injuries, frequency rate 41, 42
    - Man-days worked 41, 42, 121–133
    - Man-hours worked 41, 42
    - Number employed 48, 121–133
    - Number working daily 49, 65, 66, 121–133
    - Output per man-day 49, 56, 57, 70, 85, 86, 94–98, 121–133
    - Output per man-year 56, 57
    - Production per man-day 49, 56, 57, 70, 85, 86, 94–98, 121–133
    - Strip, man-days worked 94–98
  - Mining machines, continuous, sales 108
  - Number 49, 52, 53, 65, 66, 67–69
  - Power drills, for shot holes, use 75, 76
    - Number 75, 76
  - Rope haulage 77
  - Scrapers, sales 108
  - Shuttle cars, sales 108
  - Strip 84–98
  - Bulldozers, number 87, 89
    - Carryalls, number 87, 89
    - Daily employment 94–98
    - Draglines, number 87, 89
    - Equipment 87, 89
    - Growth 85, 86
    - Haulage 92, 93
    - Number 58, 59, 85, 86, 89–91, 94–98
    - Power drills 90, 91
- Underground 72–83
    - Haulage units 77–83
    - Mechanical loading 101–108
      - Equipment, sales 108
    - Production, per man-day 58, 59, 73, 84
    - Using mechanical loading devices, number 106
- Bituminous coal and lignite seams, thickness 52–54
    - Percentage of coal produced 52
- Carbon black:
  - Consumption and uses 316
  - Foreign Trade 317
    - Exports 318
    - Imports 317
  - General summary 309
  - Prices (carlots) 317
  - Producers 317
  - Production 312
    - Method and yield 311
    - Number and capacity of plants 311, 314
  - Sales 316
  - Salient statistics 309
  - Scope of report 310
  - Shipments 313
  - Stocks 316, 317
  - Value 317
  - World production 320
- Carbon dioxide.
- Coke and coal chemicals:
  - Ammonia:
    - NH_3 equivalent of all forms 259
    - Sulfate equivalent of all forms 216, 259, 266
      - Yield per ton of coal 216, 266
  - Ammonia liquor (NH_3 content):
    - Production 259, 266
    - Sales 259, 266
      - Value 259, 266
    - Stocks 259, 266
  - Ammonium phosphate (di- and mono-):
    - Production 259
    - Sales 259
      - Value 259
    - Stocks 259
  - Ammonium sulfate:
    - Production 259, 266
    - Sales 259, 266
      - Value 259, 266
    - Stocks 259, 266
  - Benzene (benzol):
    - Consumption 271
    - Production 259, 269, 270
      - By grades 259, 270
      - By States 269

Page

- Coke and coal chemicals—Continued
  - Benzene (benzol)—Continued
    - Sales 259, 269
      - Value 259, 269
    - Stocks 259
    - Yield from crude light oil refined 268, 269
  - Breeze (coke screenings):
    - Consumption 215, 223, 224
    - Production 215, 223, 260
      - Value 215, 223
    - Sales 215, 223, 224
      - Value 215, 223
    - Stocks 223, 241
    - Yield per ton of coal 215, 223
  - Chemical oil (tar acid oil):
    - Production 259
    - Sales 259
      - Value 259
    - Stocks 259
  - Coal:
    - Anthracite:
      - Carbonized 215, 228, 230
        - By months 228
        - By States 228, 230
      - Stocks 242
      - Value 215, 228
    - Bituminous:
      - Carbonized 12, 215, 227, 228, 230, 231
        - By months 227
        - By States 228, 230
        - From captive mines 234
      - Preparation:
        - Blending 228
        - Washed and unwashed 227, 230, 231
      - Source:
        - By States of origin 232, 233
        - By volatile content 231, 232
        - Destination (consuming States) 233
      - Stocks, by months 242
      - Value 215, 228
        - Average per ton at merchant plants 49
- Coke industry:
  - Annual review 211
  - Days active 43
  - Employment 43
  - Injuries 43
  - Salient statistics 214
  - Scope of report 214
  - Statistical summary 215, 216
  - Technology 247
  - World review 245
- Coke, oven and beehive:
  - Consumption 12, 214, 215, 235
    - In iron blast furnaces 235
    - In principal anthracite markets 202
    - Per ton of pig iron 235
  - Distribution, by consuming States and uses 240
  - Foreign trade 244
    - Exports 214, 235, 246
    - Imports 214, 235, 245
  - Prices 25, 243
  - Production 214, 215, 216, 235, 236, 238
    - By days 218, 220
    - By merchant and furnace plants 220
    - By months 218, 220
    - By States 216, 217, 221, 236, 238
    - Value 216, 217, 237, 238
    - World 214, 248
  - Sales 215, 236, 237, 238
    - Value 215, 236, 237, 238
  - Stocks 14, 214, 241
    - At merchant and furnace plants 241
    - By kinds 241
    - By months 241
    - By States 241
  - Transportation:
    - Rail 16
    - Water 16
  - Yield per ton of coal 215, 216, 217

Page

- Coke and coal chemicals—Continued
  - Gas:
    - Production 216, 259, 261
      - Used in heating ovens 261, 263
    - Disposal of surplus:
      - Distributed through city mains 259, 262
      - For industrial purposes 259, 262
      - For steel or allied plants 259, 262
      - Under boilers 259, 262
      - Value 216, 259, 262
    - Wasted 261
    - Yield per ton of coal 216, 261
  - Intermediate light oil:
    - Production 259
    - Sales 259
      - Value 259
    - Stocks 259
  - Light oil (crude):
    - Production 216, 259, 260, 268
    - Refined on premises 268
    - Sales 259
      - Value 259
    - Stocks 259, 268
    - Yield per ton of coal 216, 268
  - Ovens:
    - Beehive 214, 226
      - Abandoned, by States 226
      - Average number active, by months 226
      - New or rebuilt, by States 226
      - Number, by States 226
      - Under construction, by States 226
    - Slot 214, 224, 226
      - Abandoned, by States 224
      - Age 225
      - Kinds 226
      - New ovens, by States 224
      - Number, by States 224, 226
      - Under construction, by States 224
  - Pitch-of-tar:
    - Production 259
    - Sales 259
      - Value 259
    - Stocks 259
  - Sodium phenolate (carbolate):
    - Production 259
    - Sales 259
      - Value 259
    - Stocks 259
  - Solvent naphtha:
    - Production 259, 269
      - By States 269
    - Sales 259, 269
      - Value 259, 269
    - Stocks 259
    - Yield from crude light oil refined 268, 269
  - Tar (crude):
    - Consumption 264
      - Burned as fuel 264
      - For other purposes 264
    - Production 216, 259, 260, 264
      - Refined or topped by producers 264
      - By States 264
    - Sales 259, 264
      - Value 216, 259, 264
    - Stocks 259, 264
    - Yield per ton of coal 216, 264
  - Toluene (toluol):
    - Production 259, 269, 270
      - By grades 270
      - By States 269
    - Sales 259, 269
      - Value 259, 269
    - Stocks 259
    - Yield from crude light oil refined 268, 269
  - Xylene (xylol):
    - Production 259, 269
      - By States 269
    - Sales 259, 269
      - Value 259, 269
    - Stocks 259
    - Yield from crude light oil refined 268, 269

Page

- Crude petroleum and petroleum products:
  - Asphalt 478–486
    - Natural asphalt and bitumens 516
    - Salient statistics 479
    - Shipments 481–486
  - Aviation gasoline 438, 440, 441
  - Coke 487
  - Crude oil 383
    - Consumption and distribution 403
    - Daily average total demand 412–415
    - Production 385
      - By leading fields 388–389
      - By States 389–399
      - World 504–515
    - Receipts at refineries 407–409
    - Reserves 382
    - Runs to stills 404–406
    - Salient statistics 374
    - Stocks 416–420
    - Supply and demand 383, 384
    - Values and price 426, 427
    - Wells 400–403
      - Drilled 400–402
      - Producing 403
  - Demand by products 374–379
  - Distillate fuel oil 375, 461–465
    - Prices 461
    - Salient statistics 462
    - Shipments 463, 464
  - Employment and injuries 18, 19, 44
  - Energy from 3, 10
  - Foreign trade 495
    - Exports 495, 499–503
    - Imports 495, 496–498
    - World trade price indexes 39
  - Gasoline 374, 438–456
    - Consumption and distribution 439, 446
    - Percentage yields 432, 439
    - Pipeline shipments 439, 453–456
    - Prices 446, 452
    - Production 439–447
    - Salient statistics 440–443
    - Stocks 439, 446, 448–452
    - Supply (days) 452
  - General summary 373
  - Intercoastal shipments 493, 494
  - Jet fuel (military grade) 474, 475
    - Salient statistics 475
  - Kerosine 457–461
    - Percentage yields 432, 458
    - Prices 461
    - Salient statistics 458, 459
    - Shipments 460
  - Liquefied gases 476
  - Lubricants 471–473
    - Prices 471, 473
    - Salient statistics 472
  - Miscellaneous oils 487
  - Percentage yields 432
  - Petroleum coke 487, 491
  - Petroleum refineries 438
    - Capacity 438
    - Number of refineries 438
  - Pipeline shipments 407, 410, 453–456
    - Crude oil 407, 410, 411
    - Petroleum products 453–456
  - Price index (wholesale) 25
  - Refined products, general review 428, 429
  - Refinery districts 379–381
  - Refinery in-put and out-put 431, 434–437
  - Refinery capacity 438
  - Salient statistics 429, 430
  - Refined products, stocks 433
  - Residual fuel oil 375, 466–470
    - Prices 470
    - Salient statistics 467
    - Shipments 468, 469
  - Road oil 478
    - Salient statistics 478
    - Shipments 485, 486
  - Scope of report 375, 378, 379
  - Shipments to U.S. territories and possessions 375
  - Still gas 487, 492
  - Unfinished oils 493

Page

- Crude petroleum and petroleum products—Continued
  - Wax 487–490
    - Refinery prices 490
    - Salient statistics 488, 489
  - World oil supply 382
  - World supply and demand 504–515
- Fuel briquets and packaged fuel:
  - Fuel briquets:
    - Annual review 273
    - Binders 280
    - Capacity 277, 278
    - Consumption 274
    - Foreign trade 282
      - Exports 274, 275, 283
      - Imports 274, 275, 284
    - Production 274, 275, 278, 279
      - By months 279
      - By regions 279
      - World 274, 290
    - Raw fuels 280
    - Salient statistics 274
    - Scope of report 276
    - Shipments 274, 279, 281
      - Destination 281
      - Methods of transportation 282
      - Value 274, 279
    - Technology 284
    - World review 289
  - Packaged fuel:
    - Annual review 273
    - Binders 288
    - Capacity 285, 286
    - Production 274, 276, 286, 287
      - By months 287
      - By States 287
      - World 274, 290
    - Raw fuels 287, 288
    - Salient statistics 274
    - Scope of report 276
    - Shipments 274, 288
      - Value 274
    - World review 289
- Helium:
  - Conservation 521
  - Consumption and uses 519
  - Foreign trade 523
  - General summary 517
  - Prices 523
  - Production 517
  - Resources 520
  - Shipments 518
  - Technology 523
- Lignite. See Bituminous Coal and Lignite.
- Natural gas:
  - Consumption 322, 332–335
    - By States 329, 330, 334, 335
    - By use 336, 337
  - Employment and injuries 44
  - Exports 328
  - General summary 321
  - Gross withdrawals 323
  - Imports 328
  - Interstate shipments 328–331
  - Marketed production 326
  - Pipelines 332
  - Processed at natural-gasoline plants 340
  - Regional production and consumption 329, 330
  - Reserves 322, 324
  - Salient statistics 322
  - Scope of report 322
  - Underground storage 323, 327
  - Value at point of consumption 338, 339
  - Value at wells 329, 330
  - Wells 328
  - World production 341, 342
- Natural gas liquids:
  - Butane 344, 354, 357, 358, 362, 368, 369
  - Butane-propane mixture 344, 354, 357, 358, 362, 368, 369
  - Condensate 354
  - Demand for natural gas liquids at plants and terminals 353, 354
  - Ethane 344, 354, 359, 362, 368, 369

Page

- Natural gas liquids—Continued
  - Foreign trade 370, 371
    - Exports 370
    - Imports 370
  - Gasoline and naphtha 345, 349
  - General summary 343
  - Isobutane 344, 354, 357, 362, 368, 369
  - Isopentane 349, 354
  - Liquefied petroleum gases shipments 361–369
  - Liquefied refinery gases 355, 356
  - Natural gasoline 345, 348, 349
  - Number of plant operators 349
  - Number of plants 352
  - Prices 358
  - Production 348–352
  - Propane 344, 354, 357, 358, 362, 368, 369
  - Reserves 347
  - Salient statistics 345
  - Scope of report 344
  - Stocks 359–361
  - Storage capacity 359, 360
  - Supply and distribution 354
  - Types of plants 352
  - Used in motor fuel 353
  - Value at plants 349
- Packaged fuel. See Fuel briquets and packaged fuel.
- Peat:
  - Annual review 291
  - Commercial sales 292, 299, 300, 301
    - Value 292, 299, 300, 301
  - Consumption 292, 299
  - Government regulations 294
  - Imports 292, 303, 304, 305
  - Injuries 45
  - Production 6, 292, 298
    - By kinds 298
    - By States 299
    - World 292, 308
  - Reserves 296, 297
  - Salient statistics 292
  - Scope of report 294
  - Technology 305
  - Uses 299, 301
  - World review 306
- Pennsylvania anthracite:
  - Annual review 165–166
  - Competitive fuels 202
  - Consumption 165, 166, 167, 168, 169, 170, 201, 202
    - At cement mills 203
    - At collieries 167, 180, 181, 203
    - At oven-coke plants 168, 169, 203
    - At electric-utility plants 168, 169, 203
    - By railroads 203
    - In manufacturing briquets 203
    - In pelletizing and sintering 203
  - Days worked, average 167, 170, 195, 196
  - Distribution 168, 169, 195, 196, 197, 198, 199
    - By rail 168, 169, 201
    - By truck 168, 169, 200, 201
    - Coal year 198, 199
  - Earnings 168, 169
  - Employment 166, 167, 170, 195, 196
  - Equipment 186, 187, 188, 189
    - Cutting machines 188
    - Stripping 189
    - Underground mechanical loading 186, 187, 188
  - Foreign trade 204, 205, 206
    - Exports 166, 167, 168, 169, 204, 205
    - Imports 167, 168, 169, 204, 206
  - Injuries 166
  - Mine-water control 209
  - Mining methods 172
  - By undercutting machines 188
    - Culm bank recovery 184
    - Dredge 184
    - Strip 182
    - Underground 181
      - Loading, hand 189
        - Mechanical 186, 189

Page
Peat—Continued
  Output, per man-day 166, 167, 170, 196
    Per man-year 167, 170
  Preparation 171
  Prices 165, 190
    Retail 192
    Wholesale 168, 169, 190
      Quoted 190
  Production 165, 167, 168, 169, 172, 174, 176, 180, 181, 182, 183, 184
    By counties 181
    By dredge 186
    By fields 180, 181
    By months 168, 169, 187
    By percent of total 178, 179
    By regions 174, 176, 180, 182
    By size 165, 174, 176
    By weeks 186
    Culmbank 165, 181, 182, 185
    Strip 165, 181, 182, 183, 184, 189
    Underground 165, 181, 182, 183, 188
    Value of 165, 167, 174, 175, 176, 177, 180, 181
    World 204, 206
  Receipts, Lake dock 168, 169
    New England 168, 169
  Research 207
  Sales realization 167, 193, 194
  Shipments 168, 169
    By rail 168, 169, 174, 176, 180, 181, 201

Page
Peat—Continued
  Shipments—Continued
    By truck 168, 169, 174, 176, 180, 181, 200, 201
    By size 174, 176
      Size, by percent of total 178
  Stocks 168, 169, 203
  Value 165, 167, 174, 180, 181
  Average 194
    By size 175, 177, 193, 194
  Value, by size 174, 176
  Technology 207
    Mining 207
    Mine-water control 208
    Preparation 207
    Utilization 208
  World production 204, 206
Review of the Minerals-Fuel Industries:
  Consumption 8
  Domestic production 2
  General summary 1
  Government activities 33
  Income and investment 28
  Labor and productivity 16
  Prices and costs 22
  Research and development 31
  Stocks 14
  Transportation 15
  World review 34

○